Alacritech® Scalable Network Accelerator™ Users Guide Microsoft Windows® Edition

Version 10.0 January 2009

Preface

Disclaimer

The information in this document is subject to change without notice. Alacritech reserves the right to change any portion of these products for reasons such as improving performance or enhancing functionality. Alacritech assumes no liability arising out of the application or use of these products for anything other than its intended purpose.

Copyright

This document is copyrighted material. No part of this document may be copied by any means without the written permission of Alacritech, Inc.

This document describes Accelerators from Alacritech, Inc. This document is the official reference source for all revisions/releases of these products until rescinded by an update.

Copyright © 2000-2009 Alacritech, Inc. All rights reserved. Alacritech, the Alacritech logo, SLIC Technology and the SLIC Technology logo are registered trademarks of Alacritech, Inc. in the United States. All other marks belong to their respective owners.

Patents

One or more U.S. and international patents apply to Alacritech products, including without limitation: U.S. Patent Nos. 6,226,680, 6,247,060, 6,334,153, 6,389,479, 6,393,487, 6,427,171, 6,427,173, 6,434,620, 6,470,415, 6,591,302, 6,658,480, 6,687,758, 6,697,868, 6,751,665, 6,757,746, 6,807,581, 6,938,092, 6,941,386, 6,965,941, 6,996,070, 7,042,898, 7,076,568, 7,089,326, 7,093,099, 7,124,205, 7,133,940, 7,167,926, 7,167,927, 7,174,393, 7,185,266, 7,191,241, and 7,191,318.

Portions of the technology in Alacritech's acceleration products are used under license from Broadcom Corporation [and may be covered by one or more Broadcom U.S. Patents]. Alacritech does not have a license under the Broadcom Licensed Patents to implement certain claimed functionality with hardware and software not provided by Alacritech. No license is granted under Broadcom's patents expressly, by implication, by exhaustion or otherwise, to use or sell the acceleration technology in combination with any non-licensed hardware or software that is specifically designed to practice the Broadcom Licensed Patents.

Part Number: 900156 Rev 7 01/09

Organization of This Guide

This guide is the primary reference and operation guide for Alacritech Accelerators and contains the following sections:

Chapter 1 – Introduction introduces Alacritech Accelerators and the Dynamic TCP Offload technology on which they are based.

Chapter 2 – Software Installation includes the procedures required to install the software component and configure the operating system for correct operation.

Chapter 3 – Device Management provides the procedures for configuring, monitoring and maintaining Accelerator performance and procedures for special circumstances.

Chapter 4 – Troubleshooting and Support provides a list of possible problems and their solutions.

Appendix A – Network Software License Agreement and Warranty provides the text of the License Agreement to use the software component and the Limited Media Warranty for the software media.

Table of Contents

1 Introduction 1-1

1.1 Description 1-1

1.2 Changes from Release 9 1-1

1.3 Supported Accelerators 1-2

1.4 Operating System Compatibility 1-4

2 Software Installation 2-1

2.1 Software Installation Overview 2-1

2.2 Software Installation 2-2

2.3 Uninstalling the Accelerator 2-7

2.4 Command Line Driver Installation 2-8

3 Device Management 3-1

3.1 Starting Device Management 3-1

3.2 Running Adapter Diagnostics 3-3

3.3 Updating Flash Code 3-5

3.4 Managing Drivers 3-7

3.5 Configuring Advanced Properties 3-14

3.6 Configuring Teaming and Failover 3-19

3.7 Configuring VLAN Tagging 3-25

4 Windows Server Core 2008 4-1

4.1 Installing Alacritech Drivers 4-1

4.2 Interface Commands 4-1

4.3 Configuring Networking 4-2

4.4 Configuring Teaming 4-3

4.5 Configuring VLAN Tagging 4-5

4.6 Configuring Advanced Driver Features 4-7

5 Troubleshooting and Support 5-1

5.1 Alacritech Automated Customer Support 5-1

5.2 README Files on CD-ROM 5-1

5.3 Troubleshooting Overview 5-1

5.4 Installation Problems 5-2

5.5 Event Log Errors 5-4

5.6 Connectivity Problems 5-4

Appendix A Network Software License Agreement and Warranty A-1

1 Introduction

This guide describes how to install Release 10 software and operate Alacritech Accelerators under the Microsoft Windows family of operating systems.

1.1 Description

Alacritech Scalable Network Accelerators™ (SNAs) are single-port or multi-port network interface cards (NICs) that employ Alacritech's Dynamic TCP Offload technology, which uses an innovative application-specific integrated circuit (ASIC) for protocol processing. Accelerators operate with Microsoft TCP Chimney on Microsoft Windows XP Professional x64, Windows Vista, Windows Server 2003, and Windows Server 2008. The Scalable Network Pack (SNP) from Microsoft is required when using Microsoft Windows XP or Windows Server 2003.

The Dynamic TCP Offload increases server performance and efficiency in two specific ways:

- TCP/IP Protocol processing is offloaded onto the Accelerator, freeing the CPU for application processing and maximizing throughput
- A unique ASIC utilizes an Internet Protocol Processor (IPP), optimized for TCP/IP protocol processing, which delivers faster performance than general purpose CPUs

Dynamic TCP Offload eliminates the burden of TCP/IP protocol processing on the host CPU. With protocol processing offloaded onto the Accelerator, the CPU is freed for application processing, boosting both network and server performance.

1.2 Changes from Release 9

Release 10 has broadened the range of operating systems and applications supported by the 1800 and SES Accelerators.

In previous releases, the 1800 series supported only the Standard edition of Microsoft Windows Server. With Release 10, the 1800 models support all the same editions as the 2000 series. See Section 1.4 for a full list of supported operating systems.

Also, the SES Accelerators only offloaded iSCSI traffic in Release 9 (and earlier). Traffic not using TCP port 3260[1] would not benefit from performance gains provided by Dynamic TCP Offload and TCP Chimney. With Release 10, the SES models support offload on all TCP ports.

Note: The 1800 and SES models were discontinued by Alacritech in November 2008. Though no longer for sale, these models are still fully supported by Release 10 and have had their functionality expanded, as noted above.

[1] Port 3260 is the default port designated for iSCSI, as defined in RFC 3720: Internet Small Computer Systems Interface (iSCSI).

1.3 Supported Accelerators

This release supports the following Accelerators:

- 3000 Series 10 Gigabit Accelerators
- 1800, 2000, and 2100 Series Gigabit Accelerators

1000 Series (1000x1, SES1001) Accelerators are not supported with this software release, but will continue to be supported under earlier software releases with a major number of 7.

100 Series (100x4, 100x2 and 100x1) Accelerators are not supported with this software release, but will continue to be supported under earlier releases with a major number of 6.

1.3.1 Naming Conventions

SEN Accelerators support both network and iSCSI traffic, enabling Dynamic TCP Offload on all TCP ports.

Accelerator names ending with a T specify unshielded twisted pair (UTP) copper connections. Product names ending with an F indicate fiber-based connections. XT and XF products use PCI-X, and ET and EF products use PCI Express (PCIe).

1.3.2 Gigabit Accelerators

Release 10 applies to the following Gigabit Accelerators:

SEN Part Number	SES Part Number	Ports	PCI Bus	Medium*
SEN2001XT	SES2001XT	Single	PCI-X	10/100/1000BASE-T
SEN2002XT	SES2002XT	Dual	PCI-X	10/100/1000BASE-T
SEN2002XF	SES2002XF	Dual	PCI-X	1000BASE-SX
SEN2102ET	SES2102ET	Dual	PCIe	10/100/1000BASE-T
SEN2102EF	SES2102EF	Dual	PCIe	1000BASE-SX
SEN2104ET	SES2104ET	Quad	PCIe	10/100/1000BASE-T
SEN2104EF	SES2104EF	Quad	PCIe	1000BASE-SX
SEN1811XT	SES1811XT	Single	PCI-X	10/100/1000BASE-T
SEN1812XT	SES1812XT	Dual	PCI-X	10/100/1000BASE-T
SEN1822ET	SES1822ET	Dual	PCIe	10/100/1000BASE-T

1.3.3 10 Gigabit Accelerators

Release 10 applies to the following 10 Gigabit Accelerators:

Part Number	Ports	PCI Bus	Medium
SEN3001EF	Single	PCIe	n/a
SEN3001EF-SR	Single	PCIe	10GBASE-SR

The SEN3001EF is the model number of the board without an installed SFP+ transceiver. The SEN3001EF-SR includes a 10GBASE-SR SFP+ transceiver.

SFP+ refers to the Small Form-Factor Pluggable transceiver. The medium supported depends on the properties of the installed optical module.

The SEN3001EF supports 10GBASE-SR modules sold by Alacritech under the part number XGSFP+SR. 10GBASE-SR uses multi-mode fiber cables.

Other 10GBASE-SR and 10GBASE-LR modules should be compatible with the SFP+ standard, but Alacritech cannot guarantee their performance or compatibility. Using modules from other vendors does not affect the warranty of the card.

The SEN3001EF does not support 10GBASE-SRM, 10GBASE-LRM, or direct attach copper cabling as of this release.

1.4 Operating System Compatibility

Note: Systems using Microsoft Windows XP or Windows Server 2003 require the Scalable Network Pack (SNP) from Microsoft.

1.4.1 Gigabit Accelerators

The SEN1811XT, SEN1812XT, SEN1822ET, SES1811XT, SES1812XT, SES1822ET, SEN2001XT, SEN2002XT, SEN2002XF, SEN2102ET, SEN2104ET, SEN2102EF, SEN2104EF, SES2001XT, SES2002XT, SES2001XF, SES2002XF, SES2102ET, SES2104ET, SES2102EF, and SES2104EF are compatible with the following operating systems:

- Microsoft Windows XP Professional x64
- Microsoft Windows Vista, all 32-bit and x64 editions
- Microsoft Windows Server 2003, all 32-bit and x64 editions
- Microsoft Windows Server 2008, all 32-bit and x64 editions
- Microsoft Windows Server Core 2008, all 32-bit and x64 editions

1.4.2 10 Gigabit Accelerators

The SEN3001EF is compatible with the following operating systems:

- Microsoft Windows XP Professional x64
- Microsoft Windows Vista, all 32-bit and x64 editions
- Microsoft Windows Server 2003, all 32-bit and x64 editions
- Microsoft Windows Server 2008, all 32-bit and x64 editions
- Microsoft Windows Server Core 2008, all 32-bit and x64 editions

1.4.3 Additional Information

For the latest information on supported hardware and operating systems, see Alacritech's website at:
http://www.alacritech.com/Support/Downloads/Drivers/Default.aspx#CHOOSE

2 Software Installation

2.1 Software Installation Overview

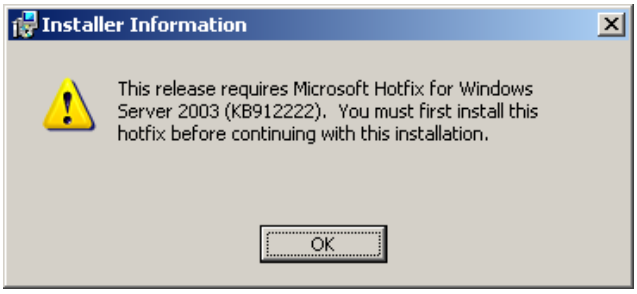
This chapter covers the installation of the software required for an Accelerator under Windows, using Windows Server 2008 as the example. The same procedure applies to other versions of Windows, though the specific windows may appear different than shown. For Windows Server Core 2008, refer to Section 4.1

Note: TCP Chimney offload will not work with the following features:

- **Windows Firewall (Windows XP enabled by Default)**
- **Internet Protocol security (IPsec)**
- **Internet Protocol Network Address Translation (IPNAT)**
- **Third-party firewalls**
- **NDIS 5.1 intermediate drivers**

If any one of these features is turned on, TCP Chimney offload will not work regardless of the registry settings. See Section 5.4.1 for instructions on disabling Windows Firewall.

Note: On XP x64 and Server 2003, Microsoft Scalable Networking Pack must be installed prior to installing Alacritech software. If Scalable Networking Pack is not installed, you will get the following popup and be unable to complete the installation. Scalable Networking Pack is included as Part of WS2003 SP2.


Installer Information
This release requires Microsoft Hotfix for Windows Server 2003 (KB912222). You must first install this hotfix before continuing with this installation.
OK

2.2 Software Installation

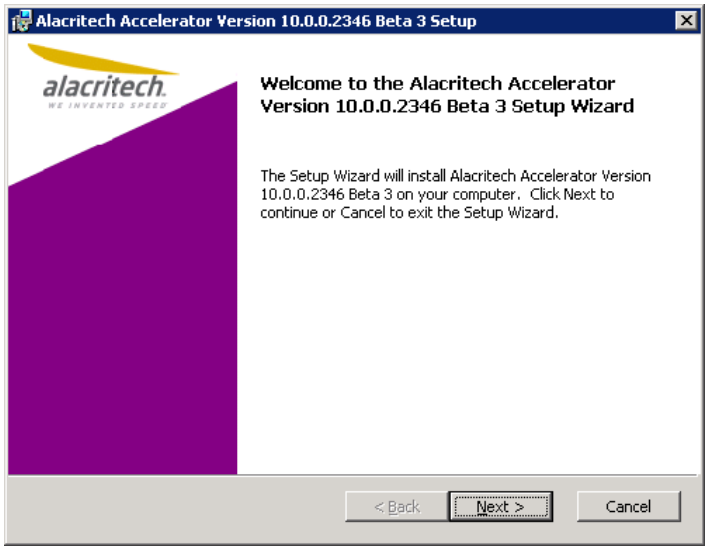
The following procedure applies whether installing a new Alacritech Accelerator or updating the driver of an existing Accelerator.

1. Install the Alacritech Accelerator using the procedure in the Alacritech Hardware Installation Guide.
2. Once the hardware has been installed, start the system. If the **Found New Hardware Wizard** appears, press **Cancel**.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Online privacy information
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

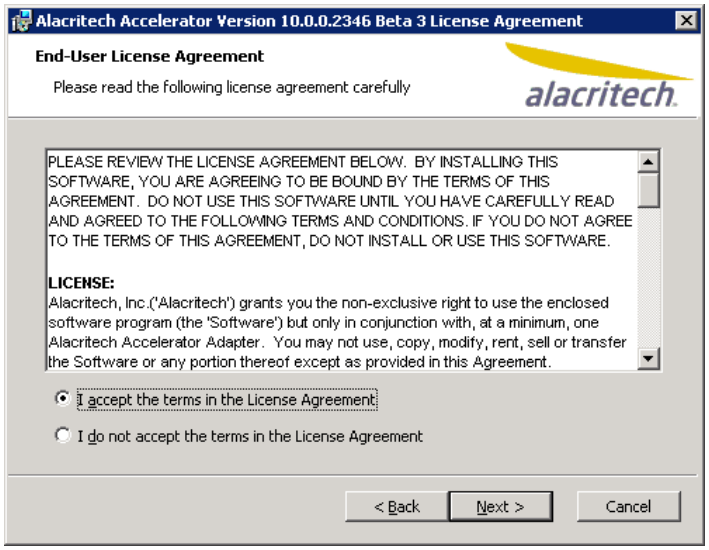
3. Insert your **Alacritech Driver Installation CD** into the system. Select the appropriate installation. If the installation is launched from the install.htm page on the CD, and default security settings are set on the browser, there may be several pop-ups asking if you want to run this package.

   Once you select run, the setup wizard will launch.


Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup
alacritech
Welcome to the Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup Wizard
The Setup Wizard will install Alacritech Accelerator Version 10.0.0.2346 Beta 3 on your computer. Click Next to continue or Cancel to exit the Setup Wizard.
< Back
Next >
Cancel

4. From the **Alacritech Accelerator Setup** click **Next** to begin the software installation.

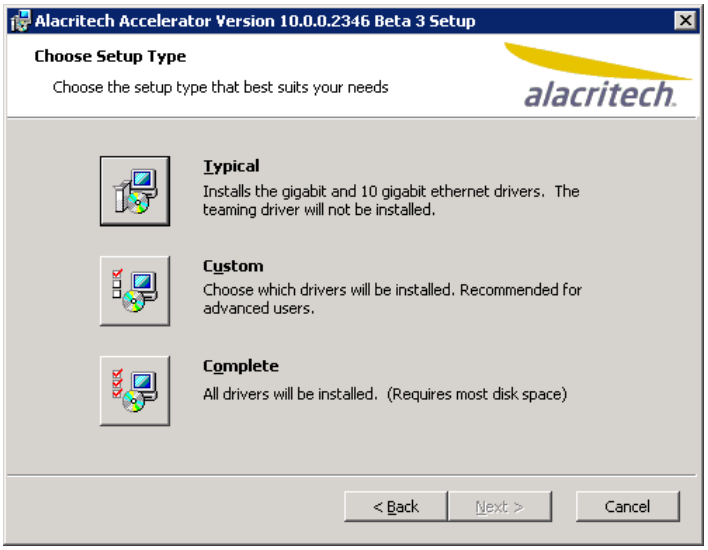
5. In the **Alacritech Accelerator Setup – Software License Agreement** window read the terms of the End User License Agreement. Select **I accept the terms of the License Agreement**, and click the **Next** button if you accept the license agreement.


Alacritech Accelerator Version 10.0.0.2346 Beta 3 License Agreement
End-User License Agreement
Please read the following license agreement carefully
alacritech
PLEASE REVIEW THE LICENSE AGREEMENT BELOW. BY INSTALLING THIS SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS AGREEMENT. DO NOT USE THIS SOFTWARE UNTIL YOU HAVE CAREFULLY READ AND AGREED TO THE FOLLOWING TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, DO NOT INSTALL OR USE THIS SOFTWARE.
LICENSE:
Alacritech, Inc.('Alacritech') grants you the non-exclusive right to use the enclosed software program (the 'Software') but only in conjunction with, at a minimum, one Alacritech Accelerator Adapter. You may not use, copy, modify, rent, sell or transfer the Software or any portion thereof except as provided in this Agreement.
I accept the terms in the License Agreement
I do not accept the terms in the License Agreement
< Back
Next >
Cancel

   If you do not accept the terms of the License Agreement, leave **I do not accept the terms in the License Agreement** selected and click **Cancel** to exit the installation.

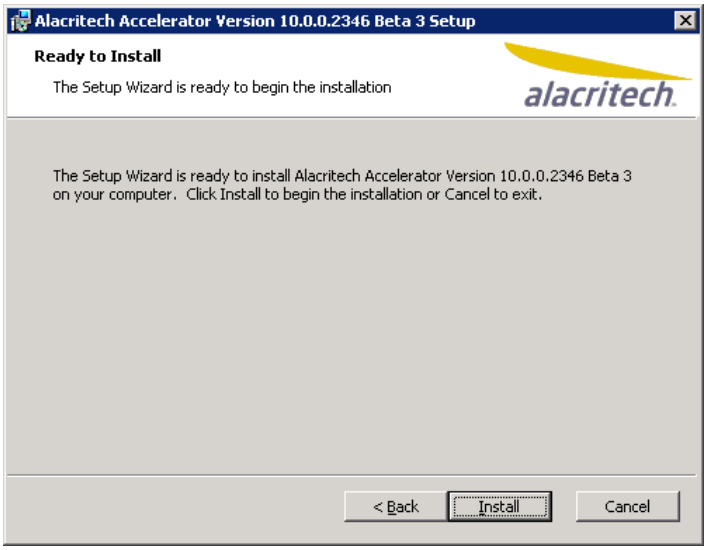
6. If you accept the agreement, the **Choose Setup Type** window will appear. From this window you can select the installation appropriate for your environment.

   - The **Typical** installation only includes the base driver
   - The **Complete** installation includes the base driver along with teaming driver to support network teaming and VLAN.
   - The **Custom** setting is for advanced users who wish to manually select which drivers will be installed.

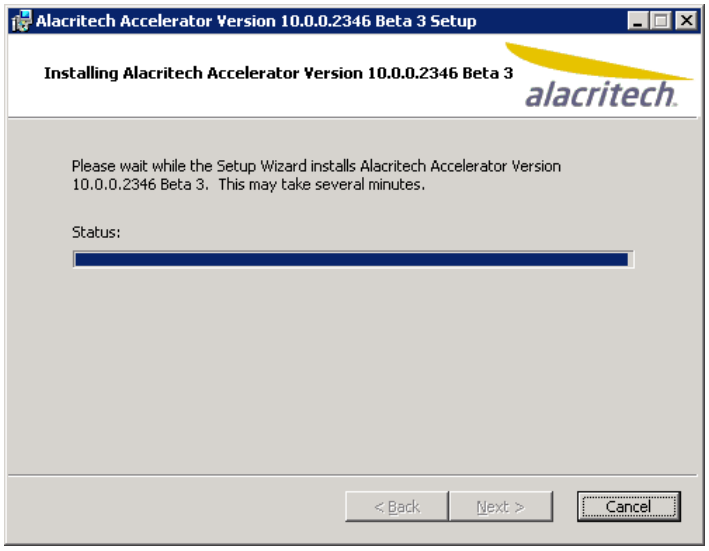

Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup
Choose Setup Type
Choose the setup type that best suits your needs
alacritech
Typical
Installs the gigabit and 10 gigabit ethernet drivers. The teaming driver will not be installed.
Custom
Choose which drivers will be installed. Recommended for advanced users.
Complete
All drivers will be installed. (Requires most disk space)
< Back
Next >
Cancel

Once you have made your selection, click **Next** to continue.

7. The **Ready to Install** window will appear.


Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup
Ready to Install
The Setup Wizard is ready to begin the installation
alacritech
The Setup Wizard is ready to install Alacritech Accelerator Version 10.0.0.2346 Beta 3 on your computer. Click Install to begin the installation or Cancel to exit.
< Back
Install
Cancel

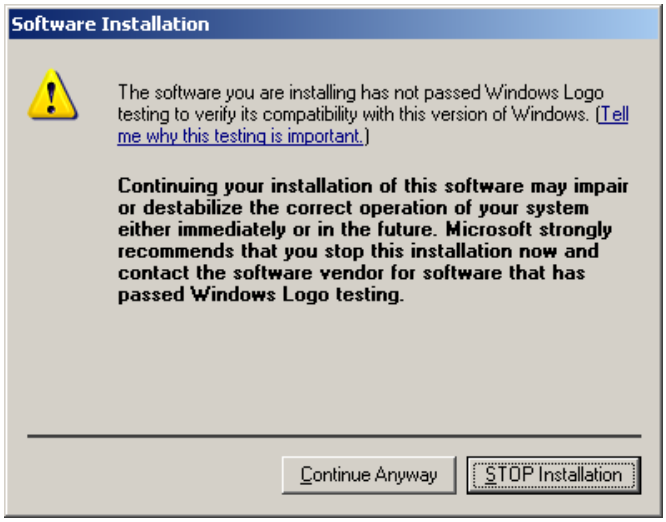
Click the **Install** button to install the software.


Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup
Installing Alacritech Accelerator Version 10.0.0.2346 Beta 3
alacritech
Please wait while the Setup Wizard installs Alacritech Accelerator Version 10.0.0.2346 Beta 3. This may take several minutes.
Status:
< Back
Next >
Cancel

8. A dialog box titled **Software Installation** or **Windows Security** may appear. This should only occur when using drivers that are not certified through the Microsoft Designed for Windows Logo process. Most official drivers released by Alacritech have digital signatures from Microsoft that will be automatically accepted, while others, including beta drivers and patches, will be self-signed by Alacritech. A self-signed driver will cause the installer to pop up a warning message.

   Windows Server 2003

   Server 2003 does not recognize self-signing, and will thus present the driver as unsigned. Click the button titled **Continue Anyway** to install the driver without a digital signature. This dialog box will appear each time the driver is installed for an adapter port. Be sure to click the **Continue Anyway** button each time.

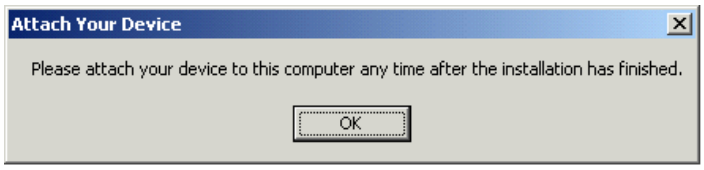

Software Installation
The software you are installing has not passed Windows Logo testing to verify its compatibility with this version of Windows. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

   Windows Server 2008

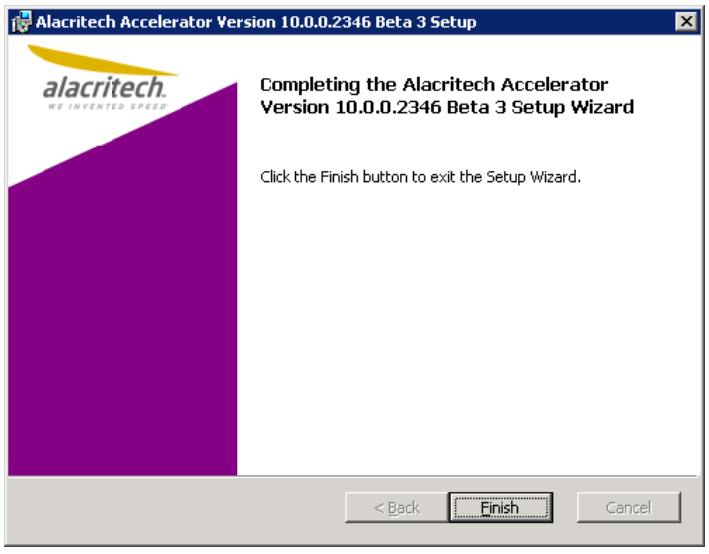
Server 2008 does recognize self-signed drivers and will pop up the following message. Go ahead a click install as many times as this pop-up appears. Or you can choose to select “Always trust Alacritech”, and you will never be bothered by this pop-up again.

Windows Security
Would you like to install this device software?
Name: Alacritech, Inc. Network adapters
Publisher: Alacritech Incorporated
Always trust software from "Alacritech Incorporated".
Install
Don't Install
You should only install driver software from publishers you trust. How can I decide which device software is safe to install?

9. If the hardware was not installed in step 1, when the install completes the **Attach Your Device** dialog box will appear. Hit **OK**.



10. Click **Finish** to exit the Setup Wizard.


Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup
alacritech
Completing the Alacritech Accelerator Version 10.0.0.2346 Beta 3 Setup Wizard
Click the Finish button to exit the Setup Wizard.
< Back
Finish
Cancel

2.3 Uninstalling the Accelerator

1. Shut down the computer, and unplug the power cable. Failure to do so may endanger you, and may damage the adapter or computer.

Note: Alacritech Accelerators use components that are sensitive to ESD. Proper ESD handling and storage should be followed.

2. Remove the computer cover and then remove the Alacritech Accelerator.
3. The Windows operating system will disable the driver software automatically when the Accelerator is removed.
   a. If you subsequently install an Accelerator, the Found New Hardware wizard will install the driver.
   b. With Release 9 and later, it is not necessary to uninstall the Alacritech Accelerator with the Hardware Manager prior to moving/removing the Accelerator.

Note: To fully uninstall the Alacritech Accelerator driver, use the Windows *Add/Remove Programs* or *Uninstall or Change a Program* function.

2.4 Command Line Driver Installation

It is assumed in this document that the user is familiar with the Microsoft command line installation tool, msiexec.exe. If this is not the case, it is recommended that at a bare minimum the user first run 'msiexec /?' to familiarize themselves with the msiexec syntax.

In order to install via the command line, you need to know the path to the '.msi' file that is appropriate for your OS. Use the following table to determine this.

Operating System	MSI PATH*
32 bit Server 2008 and Vista	wlh\x86\setupx86.msi
64 bit Server 2008 and Vista	wlh\x64\setupx64.msi
32 bit Server 2003	snp\x86\setupx86.msi
64 bit Server 2003 and XP	snp\x64\setupx64.msi

*Path relative to the root of the driver distribution CD or zip file.

In order to have full control over which driver components are installed you will need to know which MSI properties are supported. The Release 10 MSI file supports the following properties:

Property	Function
SLIC:	Installs the 1 gigabit miniport driver: **slic.sys**, **slicx86.sys**,or **slicx64.sys**.
SXG:	Installs the 10 gigabit miniport driver **sxg.sys**, **sxgx86.sys**,or **sxgx64.sys**.
SLICTEAM:	Installs the intermediate driver for teaming and VLANs: **slicteam.sys**.
ALL:	same as SLIC,SXG,SLICTEAM

SLIC and SXG are the default. If you want to install teaming and VLAN support, you need to add ADDDEFAULT=SLICTEAM or ADDDEFAULT=ALL to the msiexec commandline.

EXAMPLE: Installing everything on Server 2008 x64

```
C:\Temp> msiexec /i wlh\x64\setupx64.msi ADDDEFAULT=ALL /quiet
```

If the SXG component (10 gigabit driver) is installed, you will get a popup saying that the driver is signed by Alacritech, do you want to continue. Otherwise, the installation should complete (eventually) without interruption.

You can verify that the drivers installed successfully with netsh:

```
C:\Temp> netsh int show int
Admin State    State          Type             Interface Name
-------------------------------------------------------------------------
Enabled        Connected      Dedicated        ob1_10net
Enabled        Connected      Dedicated        ob2_csl
Enabled        Connected      Dedicated        Local Area Connection 2
Enabled        Connected      Dedicated        Local Area Connection 3
Enabled        Connected      Dedicated        Local Area Connection 1
```

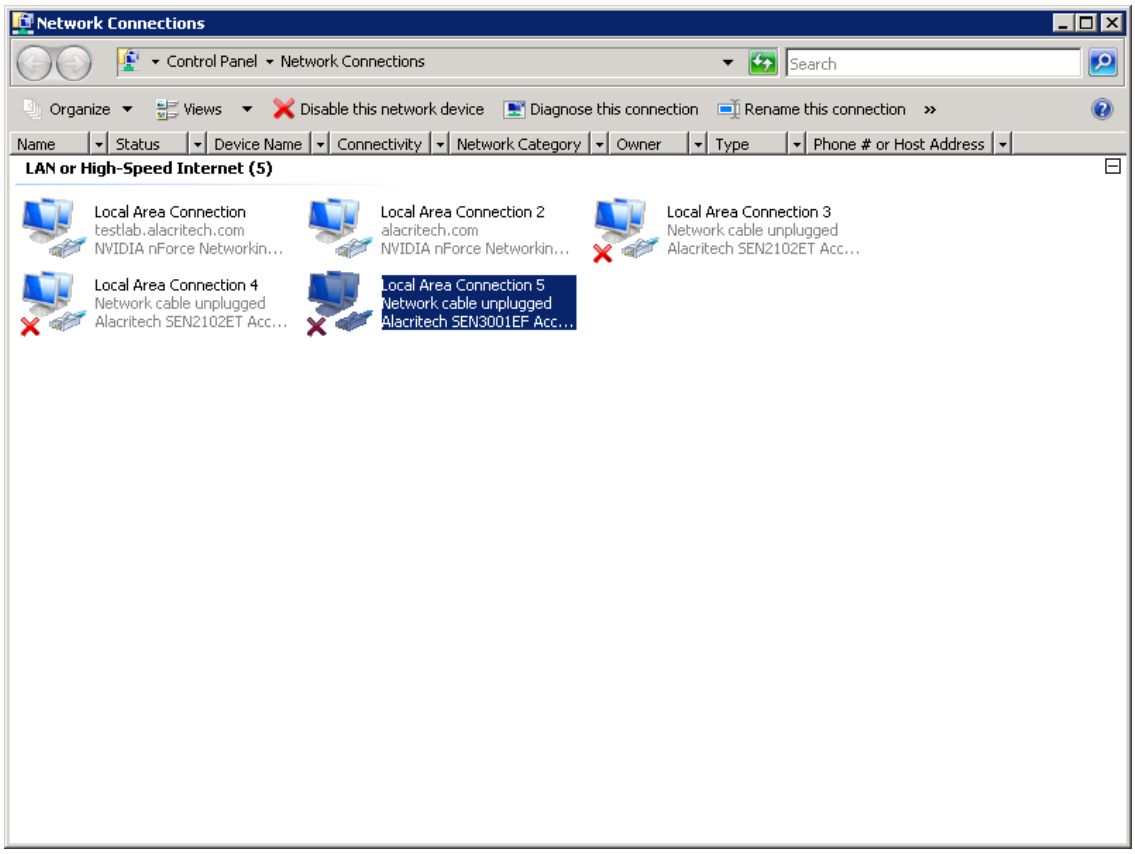
For further information on configuring Alacritech interfaces from the command line, see:

http://www.alacritech.com/Support/Documents/CommandLineInstall.aspx

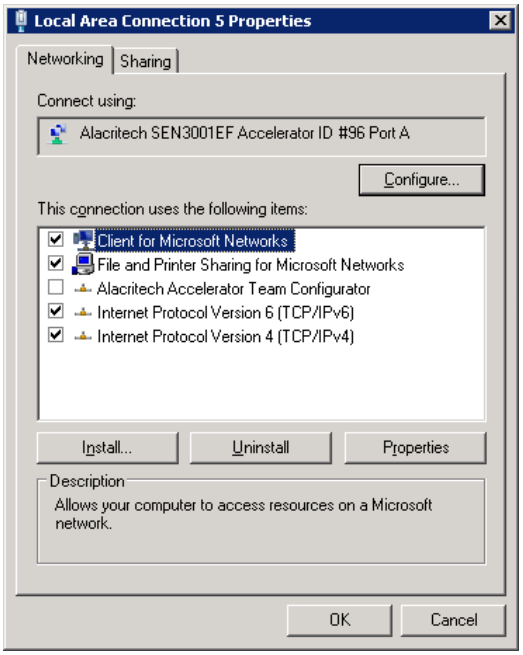
3 Device Management

3.1 Starting Device Management

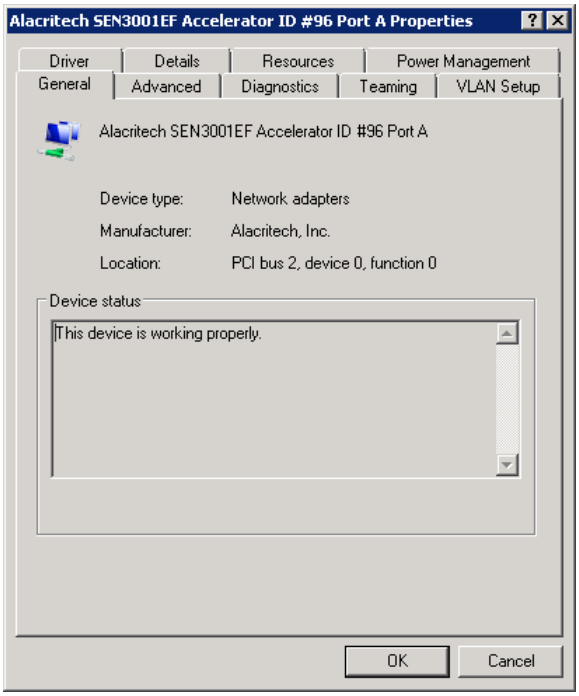
1. Open the **Network Connections** window and select a connection to manage.



Select a connection to manage by right-clicking on the connection and choosing **Properties**.



2. Click the **Configure** button. This will open the **Properties** window which will allow you to manage the device.

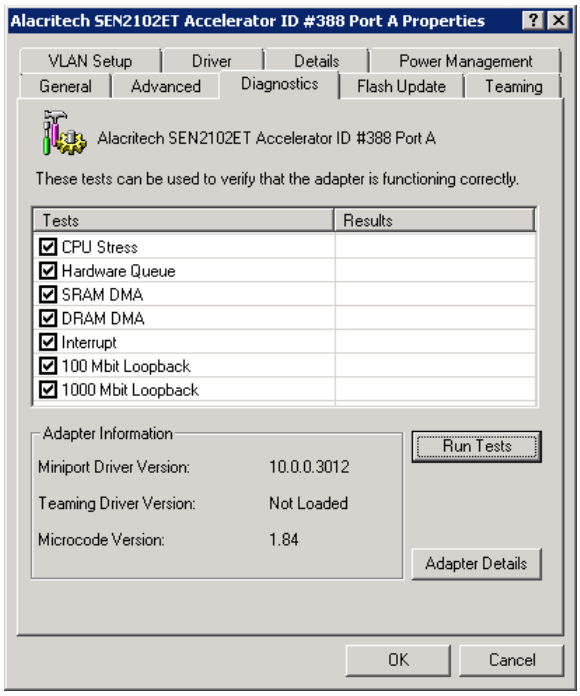


3. When device management is complete, click the **OK** button to exit the window.

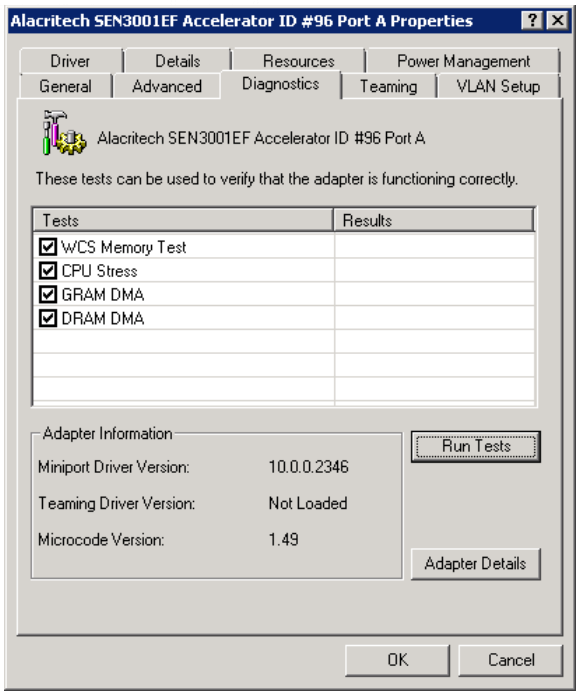
3.2 Running Adapter Diagnostics

Diagnostics can be run on any Accelerator using the following procedure:

1. Open the **Properties** window as described in Section **Error! Reference source not found.**.
2. Select the **Diagnostics** tab.



1GbE Diagnostics

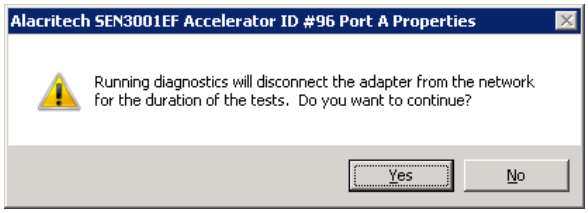


10GbE Diagnostics

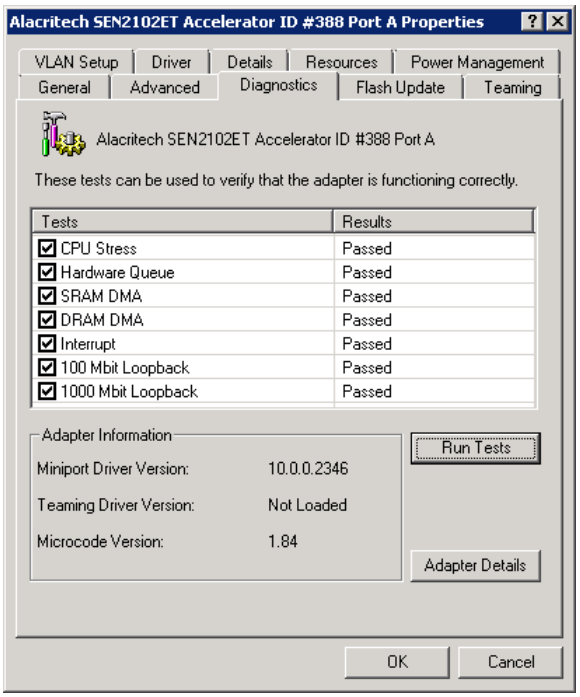
Note: Running Diagnostics will disrupt the port of the Accelerator under test.

Note: The Teaming Driver Version will indicate "Not Loaded" until a Team is created.

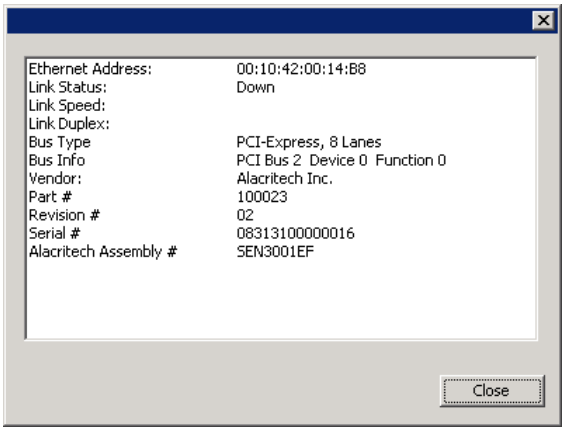
3. Click the **Run Tests** button. A warning will appear. Click the **Yes** button to run the tests.


Alacritech SEN3001EF Accelerator ID #96 Port A Properties
Running diagnostics will disconnect the adapter from the network for the duration of the tests. Do you want to continue?
Yes
No

4. The adapter will then run through self-test of the IPP and the selected Accelerator. A properly functioning board will display **Passed** for all results.



5. Additional adapter information is available by clicking the **Adapter Details** button.



6. Click the **Close** button to exit Adapter Details.

3.3 Updating Flash Code

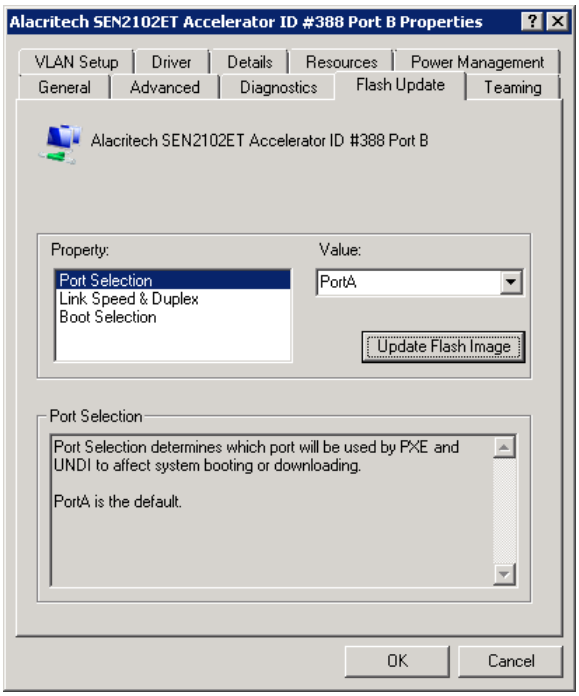
Note: This section only applies to 1GbE Accelerators.

The mechanism for flashing code on flash-capable Accelerators is provided through device manager. This is most commonly used to install PXE/UNDI drivers, which allow PXE and iSCSI software boot solutions to work. Note that these drivers do not include a BIOS-level iSCSI boot driver, and that a third-party iSCSI boot software package is needed for complete iSCSI boot support.

The latest PXE drivers are available from Alacritech's web site in the **Support** section.

To install the latest flash code on an Accelerator, follow these steps:

1. Open the **Properties** window as described in Section **Error! Reference source not found.**.
2. Click the **Flash Update** tab.



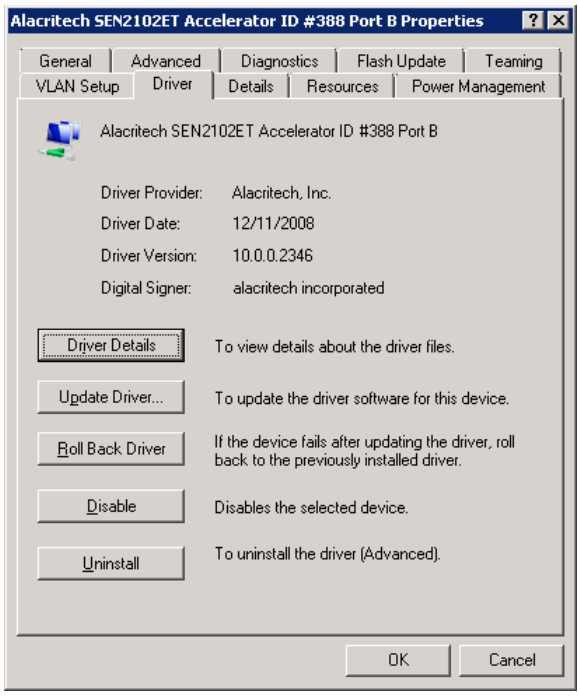
3. Set the **Port Selection**, **Link Speed**, and **Boot Selection** options, then click the **Update Flash Image** button.
4. Specify the flash image directory by either entering the appropriate path to the flash files in the **Flash Image Directory** text box or by browsing to the appropriate path by clicking the **Browse** button. By default, the Alacritech PXE/UNDI binary image files are located in the **Flashimage** folder of the driver distribution media.
5. Once the path is specified, click the **Update Flash** button to complete the flash process. NOTE: The Accelerator will not be operational during the flash update process and will disrupt all ports of the Accelerator being flashed in the server.

6. After flashing the latest PXE drivers, click the **OK** button to exit the application.

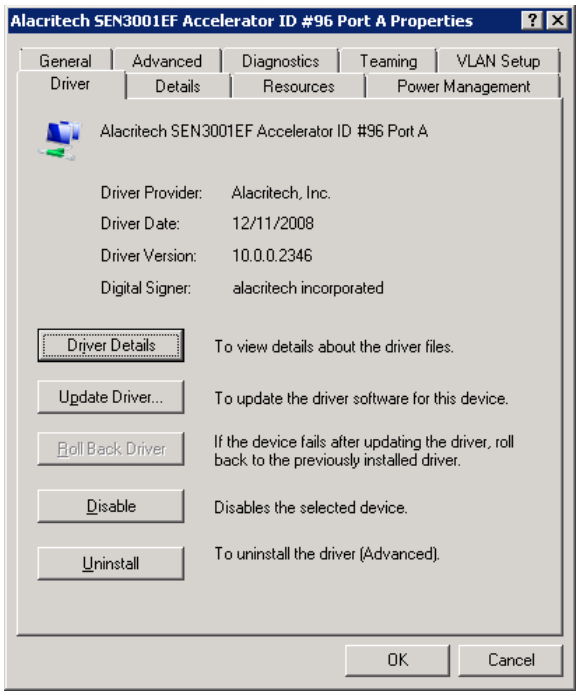
3.4 Managing Drivers

Drivers for Alacritech Accelerators can be managed through the device manager.

1. Open the **Properties** window as described in Section **Error! Reference source not found.**.
2. Select the **Driver** tab.



1GbE Driver

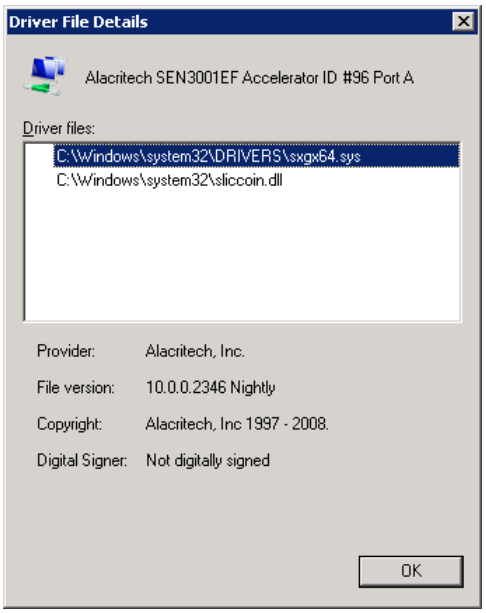


10GbE Driver

The following sections describe the functions on this tab.

3.4.1 Driver Details

Driver Details provides additional driver information that may be required to trouble-shoot problems with Alacritech customer support.



3.4.2 Update Driver…

Note: Following this procedure will only update the base driver. If teaming or VLAN functions are required, install the new, updated driver as described in Section 2.

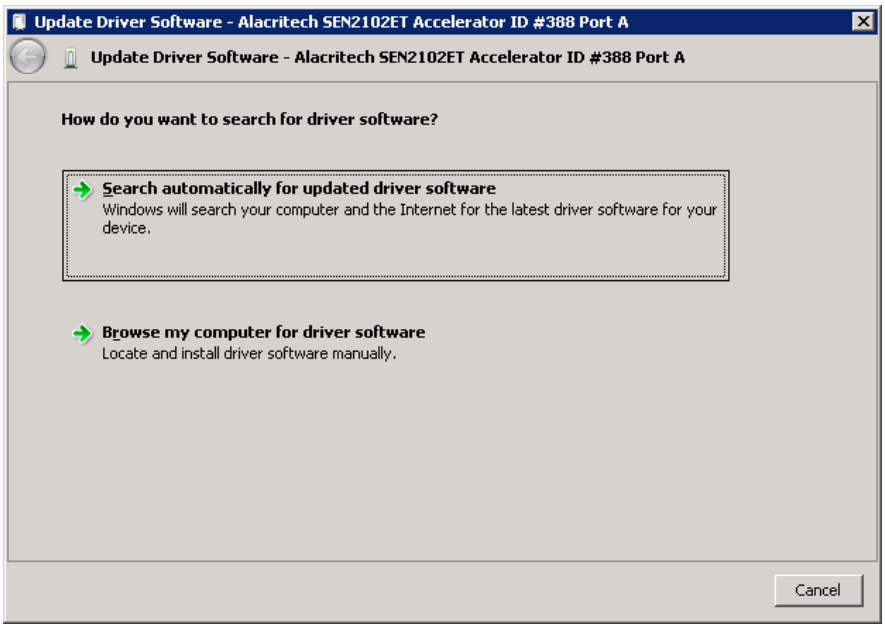
The most recent drivers are available from the Alacritech Support website at http://www.alacritech.com/Support/Downloads/Drivers/Default.aspx .

Note: This procedure may install a driver that is in fact older than the one currently installed. Be sure to verify the installed driver version after this procedure. The most recent driver

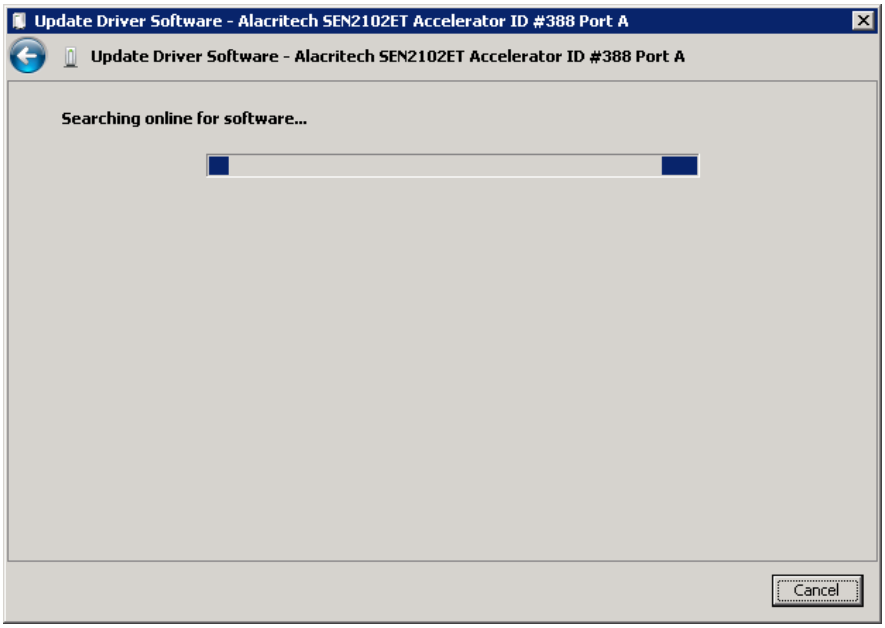
If you wish to undo the driver update, follow the **Roll Back Driver** procedure described in Section 3.4.3.

1. Press the **Update Driver…** button

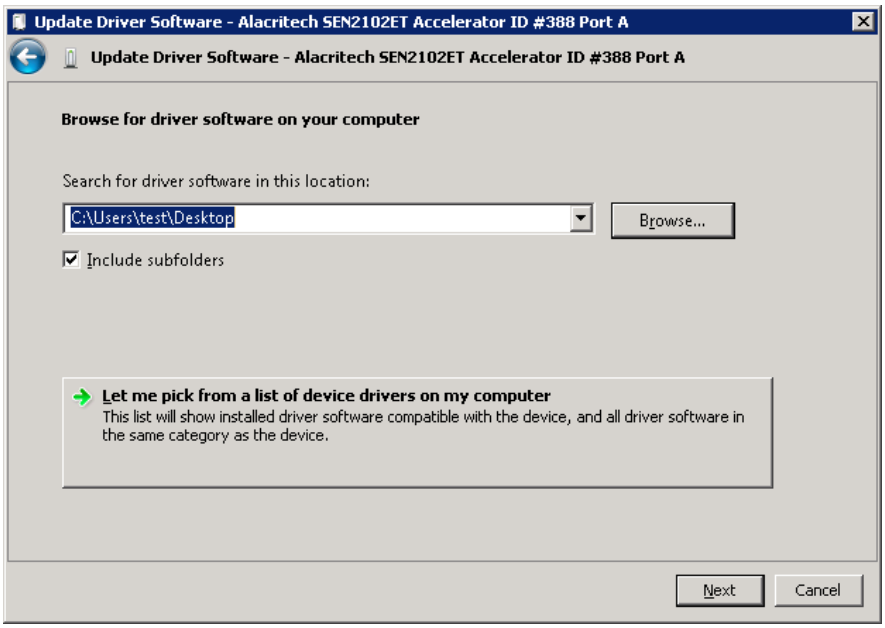
2. Specify where to find the new driver: either by performing an automated search or manually specifying the directory of the updated driver.


Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
How do you want to search for driver software?
Search automatically for updated driver software
Windows will search your computer and the Internet for the latest driver software for your device.
Browse my computer for driver software
Locate and install driver software manually.
Cancel

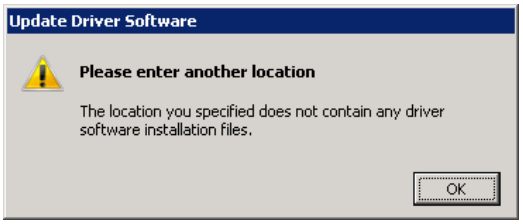
3. Selecting **Search automatically…** will bring up the following window, displaying the search progress.


Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Searching online for software...
Cancel

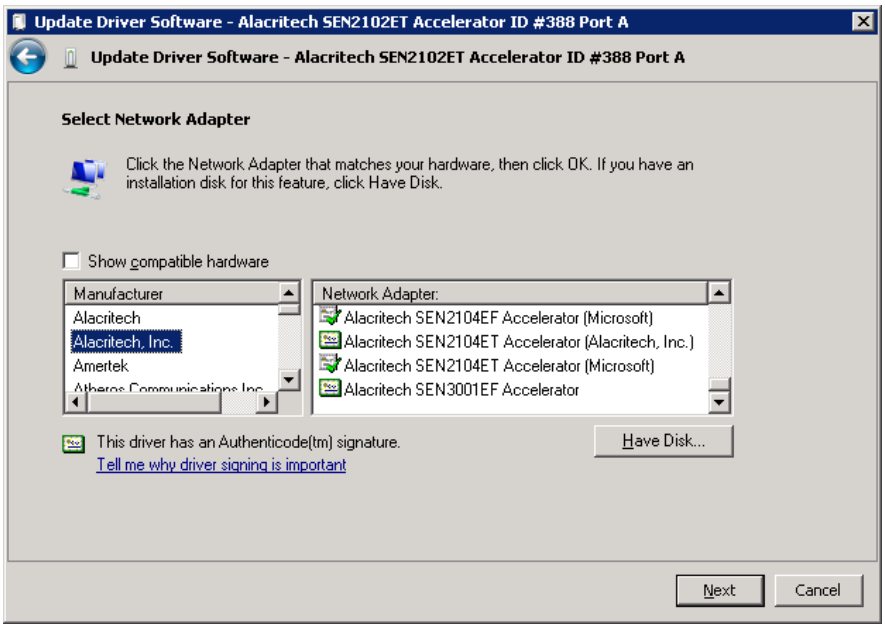
4. Selecting **Browse my computer…** will bring up a window asking to locate the driver software location. Check **Include subfolders** if you are unsure in which subfolder the proper driver is contained.


Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Browse for driver software on your computer
Search for driver software in this location:
C:\Users\test\Desktop
Browse...
Include subfolders
Let me pick from a list of device drivers on my computer
This list will show installed driver software compatible with the device, and all driver software in the same category as the device.
Next
Cancel

After specifying the folder, press **Next**. If an appropriate driver cannot be found, the following message will appear:


Update Driver Software
Please enter another location
The location you specified does not contain any driver software installation files.
OK

You may also choose to pick from a list of drivers for devices included in Windows. Choose the **Let me pick…** option to bring up the driver selection window:

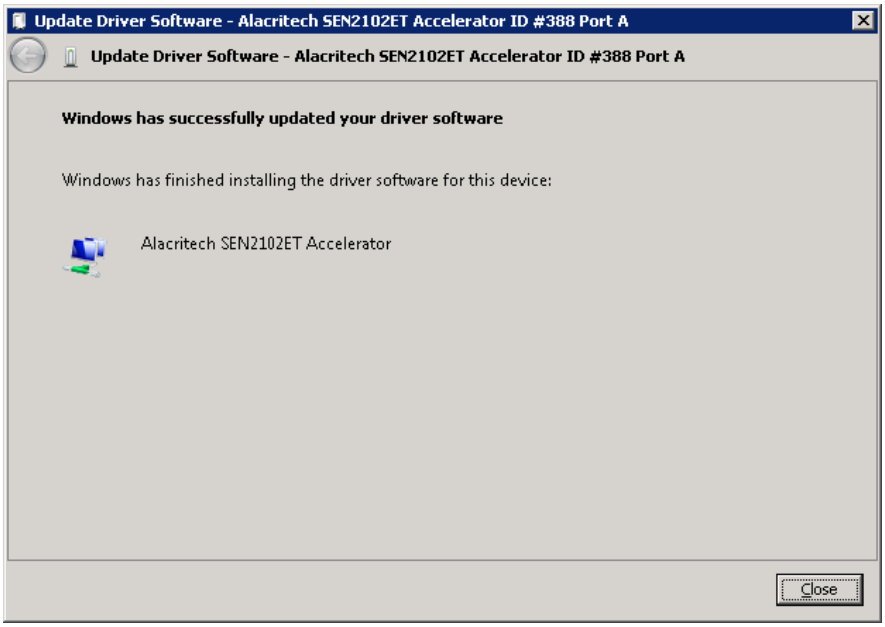

Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Select Network Adapter
Click the Network Adapter that matches your hardware, then click OK. If you have an installation disk for this feature, click Have Disk.
Show compatible hardware
Manufacturer
Alacritech
Alacritech, Inc.
Amertek
Network Adapter:
Alacritech SEN2104EF Accelerator (Microsoft)
Alacritech SEN2104ET Accelerator (Alacritech, Inc.)
Alacritech SEN2104ET Accelerator (Microsoft)
Alacritech SEN3001EF Accelerator
This driver has an Authenticode(tm) signature.
Tell me why driver signing is important
Have Disk...
Next
Cancel

To narrow down the list of drivers, check the **Show compatible hardware** box.

If you wish to install from a disk, press the **Have Disk…** button.

When you have specified the driver, click **Next**.

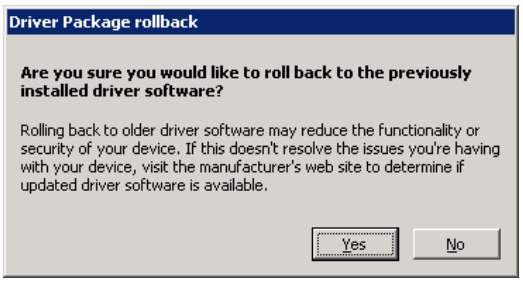
5. Once the driver is successfully located, it will automatically update the driver and display the following window.


Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Update Driver Software - Alacritech SEN2102ET Accelerator ID #388 Port A
Windows has successfully updated your driver software
Windows has finished installing the driver software for this device:
Alacritech SEN2102ET Accelerator
Close

3.4.3 Roll Back Driver

This function reverts the system back to the previously installed driver. This function can only be used to roll back to a driver of the same major release number. For example, reverting from release 9.3 to 9.1 or 10.0.1.5413 to 10.0.0.3012, but not from 10.0 to 9.3.

1. Press the **Roll Back Driver** button. A warning message will appear.

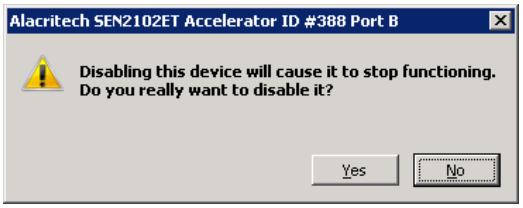

Driver Package rollback
Are you sure you would like to roll back to the previously installed driver software?
Rolling back to older driver software may reduce the functionality or security of your device. If this doesn't resolve the issues you're having with your device, visit the manufacturer's web site to determine if updated driver software is available.
Yes
No

2. Press **Yes** to confirm the roll back.

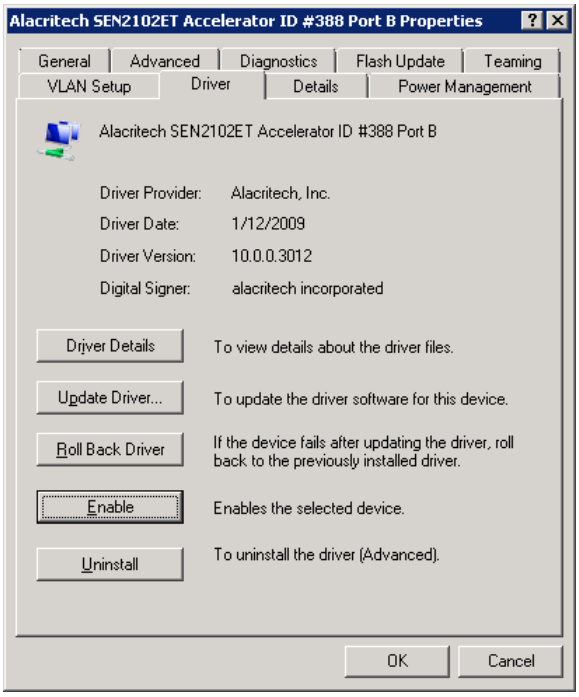
3.4.4 Disable

This function disables the Accelerator and should only be used for troubleshooting purposes.

1. Press the **Disable** button. A warning message will appear.


Alacritech SEN2102ET Accelerator ID #388 Port B
Disabling this device will cause it to stop functioning.
Do you really want to disable it?
Yes
No

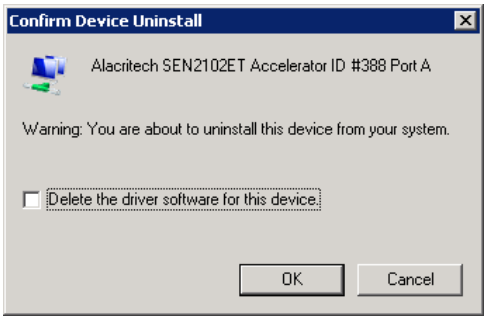
2. Press **Yes** to confirm.
3. Once the Accelerator is disabled, the **Disable** button is replaced by an **Enable** button. To re-enable the Accelerator, press the button.



3.4.5 Uninstall

Uninstall removes only the base driver. To completely uninstall the driver, use the Windows *Add/Remove Programs* or *Uninstall or Change a Program* function.

1. Press the **Uninstall** button. A warning message will appear.

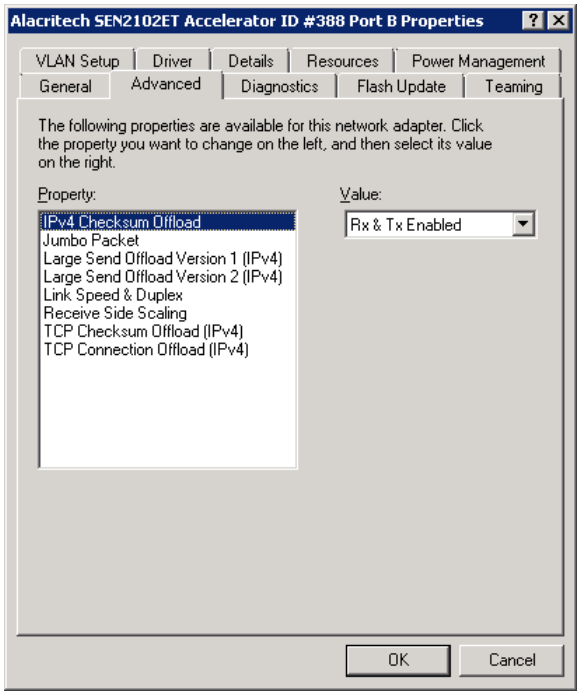

Confirm Device Uninstall
Alacritech SEN2102ET Accelerator ID #388 Port A
Warning: You are about to uninstall this device from your system.
Delete the driver software for this device.
OK
Cancel

2. Press **OK** to confirm.

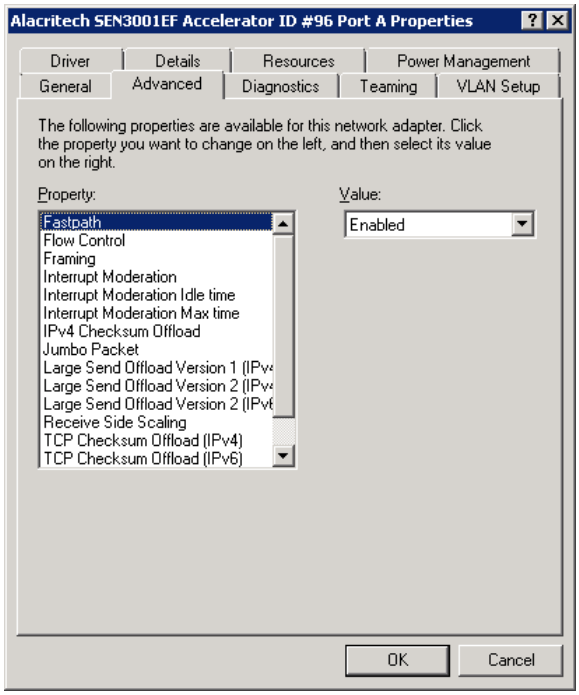
3.5 Configuring Advanced Properties

Alacritech Accelerators support the advanced features TCP Checksum Offload and TCP Offload.

1. Open the **Properties** window as described in Section **Error! Reference source not found.**.
2. Select the **Advanced** tab.



1GbE Advanced Options



10GbE Advanced Options

3.5.1 Properties

The following properties are configurable in the **Advanced** tab. Highlight the item in the **Properties** field and select the desired **Value**. Some properties only apply to the 10GbE accelerator.

Fastpath (10GbE Only)

The fastpath option modifies the internal behavior of the Alacritech Accelerator driver and is included here for troubleshooting purposes. Its value should not be changed without explicit directions from Alacritech customer support. The default value is **Enabled**.

Flow Control (10GbE Only)

Flow control through the use of pause frames can reduce congestion and the loss of data. To work properly, flow control must be enabled on the Accelerator, the switch, and all other devices in the data path. The default value is **Enabled**.

> **Note: The use of flow control in 10GbE LAN and iSCSI SANs is highly recommended.**

Framing (10GbE Only)

Framing allows for the efficient processing of small blocks of data, improving throughput and efficiency. The default value is **Enabled**.

Interrupt Moderation (10GbE Only)

Interrupt Moderation improves server efficiency by reducing the number of interrupts the Alacritech Accelerator sends to the host CPU. Increasing the time between interrupts reduces CPU utilization, but can increase latency, depending on the amount of time the Accelerator stays idle compared to moving data. By adjusting the Idle and Max time values, you can fine-tune the performance of the Alacritech Accelerator. The default value is **Enabled**.

Interrupt Moderation Idle time (10GbE Only)

The Idle time is the maximum amount of time the Accelerator can stay idle (not moving data) without generating an interrupt. The Idle time should be set to value lower than the Max time. The default value is **16** microseconds. The maximum value is 64.

Interrupt Moderation Max time (10GbE Only)

The Max time is the total maximum time between interrupts, regardless of whether or not the Accelerator is idle. The Max time should be set to a value higher than the Idle time. The default value is **64** microseconds. The maximum value is 256.

IPv4 Checksum Offload

The IP Checksum Offload option allows the Accelerator to offload the IP checksum calculations for transmitted and received IP data. This only applies when the Accelerator has the TCP Offload disabled or the Microsoft stack has chosen not to offload a TCP connection to the Alacritech Accelerator. An example of this would be the used of IPSec which cannot be offloaded to the Alacritech Accelerator. The default value is **Enabled**.

Jumbo Packet

The standard maximum Ethernet frame size, including MAC addresses, Length/Type field, and 1500-byte payload, and Frame Check Sequence (FCS) is 1518 bytes. Using jumbo frames with larger payloads improves network efficiency by reducing the overall number of frames. Setting the value to 9014 allows the Accelerator to send and receive frames up to 9014 bytes in length (9018 bytes including the FCS).When To avoid frame loss, all devices in the data path much support jumbo frames. The default value is **1514** (standard frame size, not counting the FCS).

Large Send Offload Version 1 (IPv4)

Large Send Offload (LSO), also known as TCP Segmentation Offload (TSO), is a "stateless" offload technology supported by the Alacritech Accelerator. When enabled, the Accelerator performs the task of segmenting the data into TCP datagrams, saving cycles from the host CPU. Version 1 supports a maximum segment offload size of 64kb. As with IP Checksum Offload, this only applies when the Accelerator has the TCP Offload disabled or the Microsoft stack has chosen not to offload a TCP connection to the Alacritech Accelerator. The default value is **Enabled**.

Large Send Offload Version 2 (IPv4)

Large Send Offload (LSO), also known as TCP Segmentation Offload (TSO), is a "stateless" offload technology supported by the Alacritech Accelerator. When enabled, the Accelerator performs the task of segmenting the data into TCP datagrams, saving cycles from the host CPU. Version 2 supports a maximum segment offload size of 256kb. As with IP Checksum Offload, this only applies when the Accelerator has the TCP Offload disabled or the Microsoft stack has chosen not to offload a TCP connection to the Alacritech Accelerator. The default value is **Enabled**.

Large Send Offload Version 2 (IPv6) (10GbE Only)

Large Send Offload (LSO), also known as TCP Segmentation Offload (TSO), is a "stateless" offload technology supported by the Alacritech Accelerator. When enabled, the Accelerator performs the task of segmenting the data into TCP datagrams, saving cycles from the host CPU. Version 2 supports a maximum segment offload size of 256kb. As with IP Checksum Offload, this only applies when the Accelerator has the TCP Offload disabled or the Microsoft stack has chosen not to offload a TCP connection to the Alacritech Accelerator. The default value is **Enabled**.

Link Speed & Duplex (1GbE Only)

Normally, the link speed and duplex rate of the connection is determined through and auto-negotiation process. In some cases, such as troubleshooting a poor connection, the data transfer rate may be specified manually.

The default value is **Auto Detect**. The other setting values, based on the media (copper or fiber interface), and their effects, are shown in the table below:

Media	Setting	Description
Copper	10 Mbps Full Duplex	Sets data rate to a maximum of 10 megabits per second bi-directionally
	10 Mbps Half Duplex	Sets data rate to a maximum of 10 megabits per second unidirectionally
	100 Mbps Full Duplex	Sets data rate to a maximum of 100 megabits per second bi-directionally
	100 Mbps Half Duplex	Sets data transmission rate to a maximum of 100 megabits per second unidirectionally
	1000 Mbps Full Duplex	Sets data transmission rate to a maximum of 1000 megabits per second bi-directionally
	Auto Detect	The controller will detect the optimum data transmission rate for a given connection
Fiber	1000 Mbps Full Duplex	Sets data transmission rate to a maximum of 1000 megabits per second bi-directionally
	Auto Detect	The controller will detect the optimum data transmission rate for a given connection. It will negotiate 1000 Mbps Full Duplex

Receive Side Scaling

Receive Side Scaling (RSS) allows network interrupts from the Alacritech Accelerator to be spread over all CPU cores in a multi-core server, improving efficiency and overall server performance. The default value is **Enabled**.

TCP Checksum Offload (IPv4)

The TCP Checksum Offload (IPv4) option allows the Accelerator to offload the TCP checksum calculations for transmitted and received TCP data over IP version 4. As with IP Checksum Offload, this only applies when the Accelerator has the TCP Offload disabled or the Microsoft stack has chosen not to offload a TCP connection to the Alacritech Accelerator. The default value is **Enabled**.

TCP Checksum Offload (IPv6) (10GbE Only)

The TCP Checksum Offload (IPv6) option allows the Accelerator to offload the TCP checksum calculations for transmitted and received TCP data over IP version 6. As with IP Checksum Offload, this only applies when the Accelerator has the TCP Offload

disabled or the Microsoft stack has chosen not to offload a TCP connection to the Alacritech Accelerator. The default value is **Enabled**.

TCP Connection Offload (IPv4)

This option is included here for troubleshooting purposes. When TCP Connection Offload is disabled, the Accelerator will present itself to Microsoft Windows as non-offload card and it will not offload IPv4 traffic. The default value is **Enabled**.

TCP Connection Offload (IPv6) (10GbE Only)

This option is included here for troubleshooting purposes. When TCP Connection Offload is disabled, the Accelerator will present itself to Microsoft Windows as non-offload card and it will not offload IPv6 traffic. The default value is **Enabled**.

3.6 Configuring Teaming and Failover

Alacritech drivers support network teaming and failover.

Given the flexible nature of Alacritech's teaming implementation, it is possible that it may work with other proprietary solutions as well. For more information on our current teaming support, visit our Customer Support website at http://www.alacritech.com/Support/Overview.aspx

It is important to note that EtherChannel and 802.3AD require that the team be configured on the host and on the switch that the host connects to.

Note: Alacritech's Teaming implementation does not support the optional Port Aggregation Protocol (PAgP) feature that is part of the EtherChannel Protocol. Nor is the LACP portion of the 802.3ad protocol Supported. PAgP/LACP facilitates the automatic creation of link aggregation groups by exchanging packets between channel-capable ports. All EtherChannel or Link Aggregation groups that connect to Alacritech Accelerator teams must be manually configured. The specific details of manual vs. auto configuration are vendor specific. Consult your switch documentation.

Note: For configuring Teaming under Windows Server Core 2008, refer to Chapter 4.

3.6.1 Teaming Types

Two different types of failover are supported:

- Cisco Fast EtherChannel/802.3AD (1GbE only)
- Hot Stand-by Fail-over

Cisco Gigabit EtherChannel/802.3AD

Creates a team of two or more fast/gigabit Ethernet connections into a single logical interface.

Because each port in the logical group shares the same MAC address, it is required that each of the ports be connected to a single Fast EtherChannel or Gigabit EtherChannel switch.

If a link fails in a fast Etherchannel or gigabit Etherchannel group, the server and the switch each independently identify the link failure and switches to another link.

Hot Stand-by Fail-over.

This is a fail-over/redundancy option (no load balancing). One adapter is placed online while other adapters in the team are offline. If the link for the online adapter fails, it is taken offline and one of the other adapters is set online in its place.

The Alacritech Accelerators allow for the creation of a Hot Stand-by Fail-over team between 10GbE and 1GbE Accelerators.

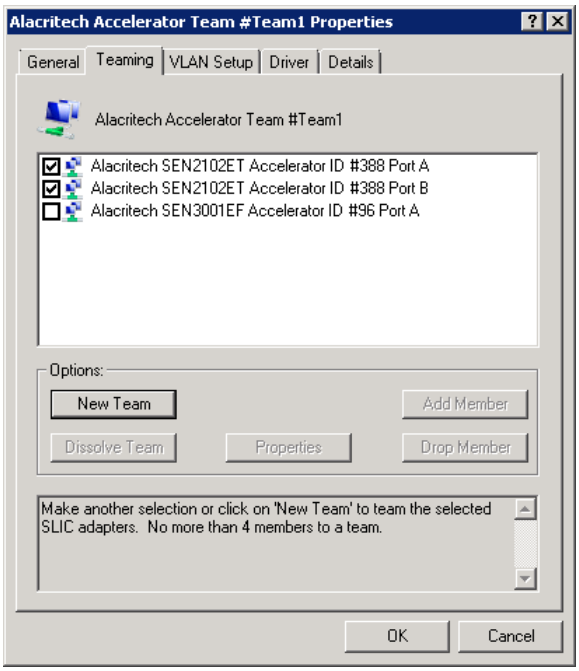
3.6.2 Recommended Order of Implementation

Alacritech strongly recommends that teams be created using the following sequence. Using an alternative sequence of steps may result in unpredictable behavior.

1. Establish TCP/IP communication over a single Ethernet link. If this is a new installation of an Alacritech Accelerator it is important that network connectivity be established before configuring a team. All other ports that will later be used on the team should be disabled and not have cables connected to them.
2. If using EtherChannel/802.3AD, set up the switch according to the vendor's instructions. Once the team is set up on the switch you will have full network connectivity as long as there is only one physical connection to the host.
3. Set up the team on the host using the steps below.
4. Connect the remaining Ethernet cables to the appropriate switch and host ports. Verify the link on all connections. You should now have a fully functional team.

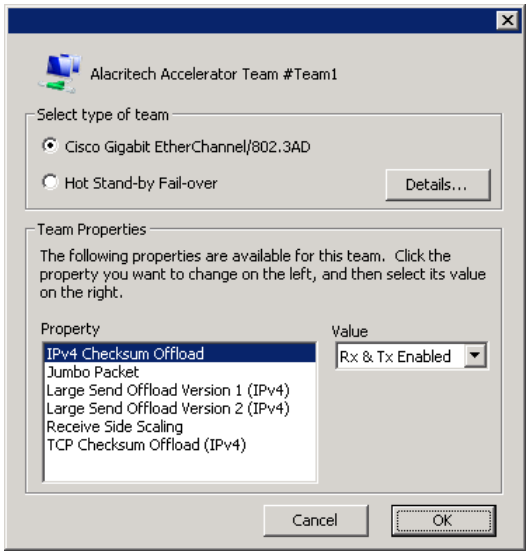
3.6.3 Configuring a team

1. Open the **Properties** window as described in Section **Error! Reference source not found.**.
2. Select the **Teaming** tab.

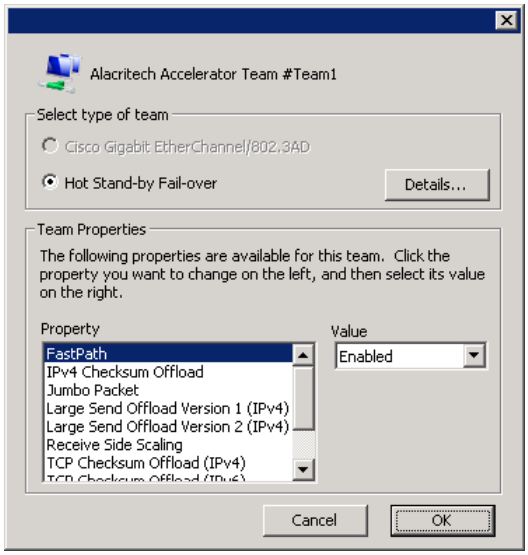


3. To configure a team, check the interfaces you wish to team and click the **New Team** button.

4. The Team Properties window allows you to configure the type of team as well as the Team Properties.


Alacritech Accelerator Team #Team1
Select type of team
Cisco Gigabit EtherChannel/802.3AD
Hot Stand-by Fail-over
Details...
Team Properties
The following properties are available for this team. Click the property you want to change on the left, and then select its value on the right.
Property
Value
IPv4 Checksum Offload
Jumbo Packet
Large Send Offload Version 1 (IPv4)
Large Send Offload Version 2 (IPv4)
Receive Side Scaling
TCP Checksum Offload (IPv4)
Rx & Tx Enabled
Cancel
OK

1GbE Teaming Options



10GbE Teaming Options

The **Details…** button provides more information on each type of team.

The **Team Properties** are identical to the Advanced Properties as described in Section 3.5.1.

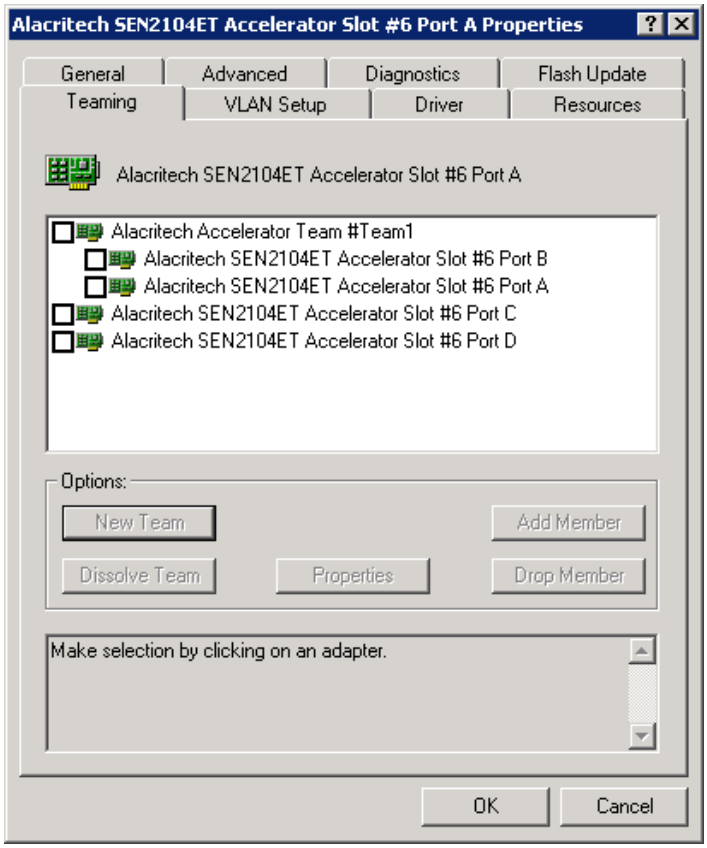
5. The default is Cisco Fast EtherChannel/802.3AD.

   If Cisco Fast EtherChannel/802.3AD is selected then you must have a switch that supports one of these protocols.

   If you have selected a team consisting of both 1GbE and 10GbE ports, only **Hot Stand-by Fail-over** teaming is allowed. Select **OK**.

6. The default is Cisco Fast EtherChannel/802.3AD.

7. The team will now be shown in the properties window.



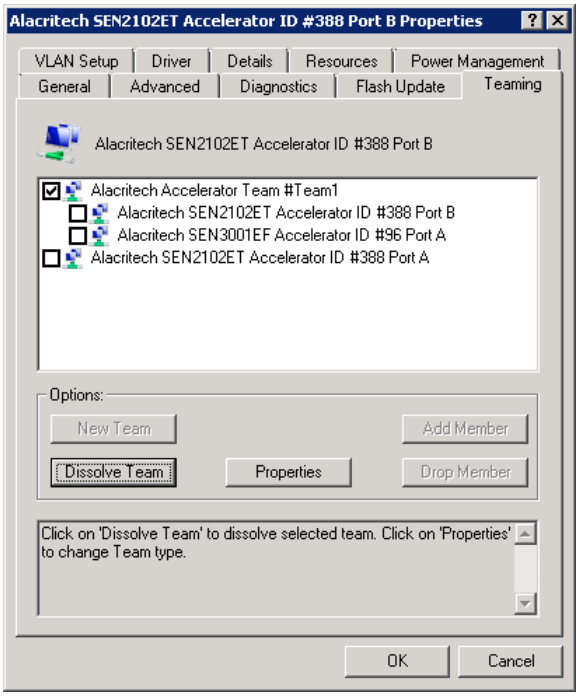
The team will not be created until you press the **OK** button. The newly-created team will appear in the list of LAN connections.

3.6.4 EtherChannel/802.3ad Teaming Guidelines and Restrictions

- If you disable a port in a team, it is treated as a link failure and its traffic is transferred to one or more of the remaining ports in the team.
- Configure all ports in a team to operate at the same speed and duplex mode (full or half duplex).
- Ensure that all ports in a team have the same configuration on both ends of the link.
- Teaming is not supported in a Team that combines 10GbE and 1GbE ports. Adding a 10GbE port to a 1GbE Team (or vice-versa) will change it automatically to Hot Stand-by Fail-over.

3.6.5 Removing Teaming

1. Open the **Properties** window as described in Section **Error! Reference source not found.** and select the **Teaming** tab.



2. Select the team you want to dissolve.
3. Click the **Dissolve Team** button.

3.6.6 Adding Members from a Team

1. Open the **Properties** window as described in Section **Error! Reference source not found.** and select the **Teaming** tab.
2. Select the team you wish to add members to as well as the ports you wish to add.
3. Press the **Add Member** button.
4. Press the **OK** button to finalize the change to the team.

3.6.7 Dropping Members from a Team

1. Open the **Properties** window as described in Section **Error! Reference source not found.** and select the **Teaming** tab.
2. Select the team you wish to modify and the port you wish to drop.
3. Press the **Drop Member** button.
4. Press the **OK** button to finalize the change to the team.

3.7 Configuring VLAN Tagging

Alacritech drivers support VLAN Tagging allowing the user to create Virtual Local Area Networks when used with switches conforming to the IEEE 802.1Q VLAN Tagging Specification.

Note: For configuring Teaming under Windows Server Core 2008, refer to Chapter 4

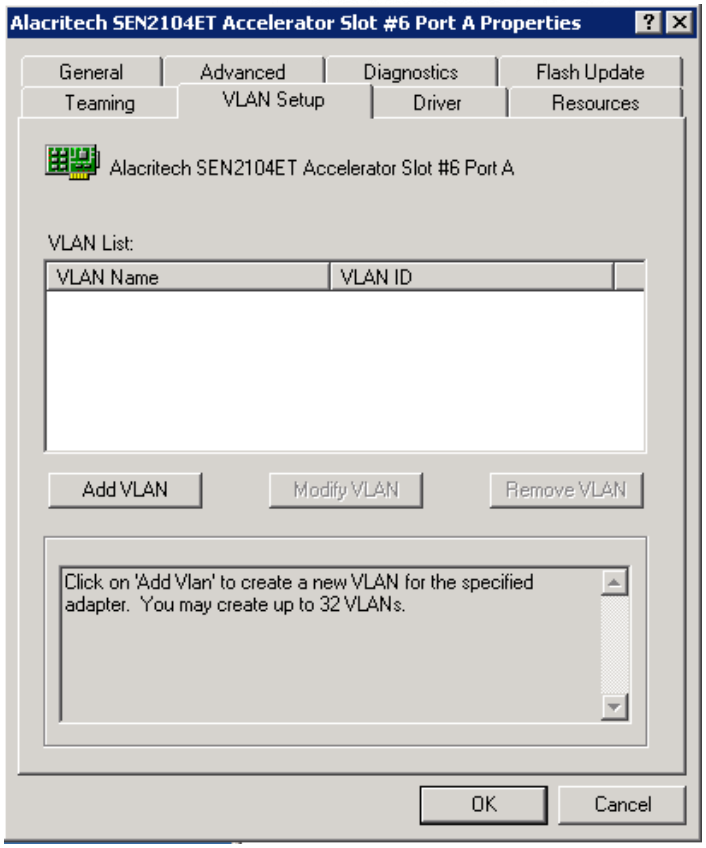
3.7.1 Recommended Order of Implementation

Alacritech strongly recommends that VLANs be created using the following sequence. Using an alternative sequence of steps may result in unpredictable behavior.

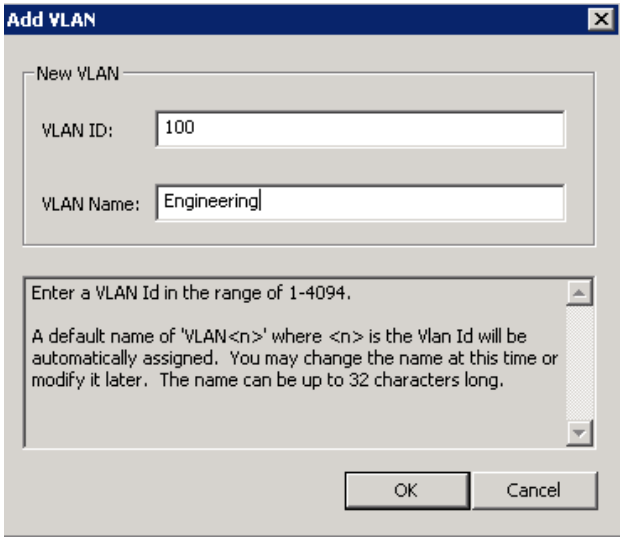
1. Configure the switch on which the VLAN is to be created. Different switch vendors have different configuration interfaces which are outside the scope of this document, but the basic procedure is as follows. (For the purposes of this example two VLANs are created—one for the Engineering department (100) and one for the Finance department (200))
    a. Create the Engineering VLAN within the switch and assign it a tag of 100.
    b. Add the Engineering tag (100) to the switch port connecting to the Alacritech Accelerator (usually on a server). Add the Engineering tag (100) to each switch port connected to an Engineering computer.
    c. Repeat Step a. for the Finance VLAN (tag of 200).
    d. Add the Finance tag to the same switch port connecting to the Alacritech Accelerator. Add the Finance tag (200) to each switch port connecting to a Finance computer.
2. Follow the ‘Configuring a VLAN’ procedure to configure the Alacritech Accelerator.

3.7.2 Configuring a VLAN

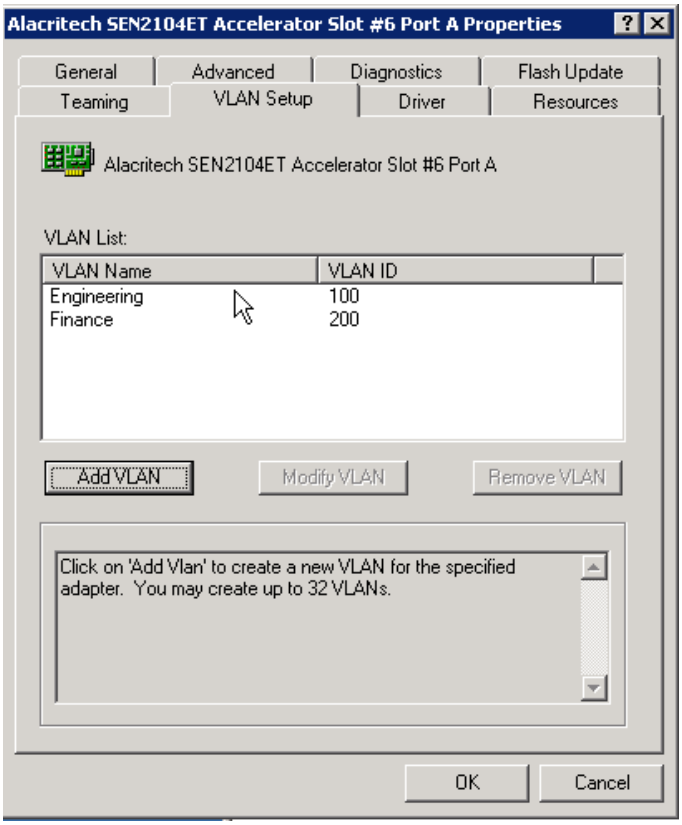
1. Open the **Properties** window as described in Section **Error! Reference source not found.**.
2. Click the **Configure** button. The Accelerator **Properties** dialog box will appear. Select **VLAN Setup**.



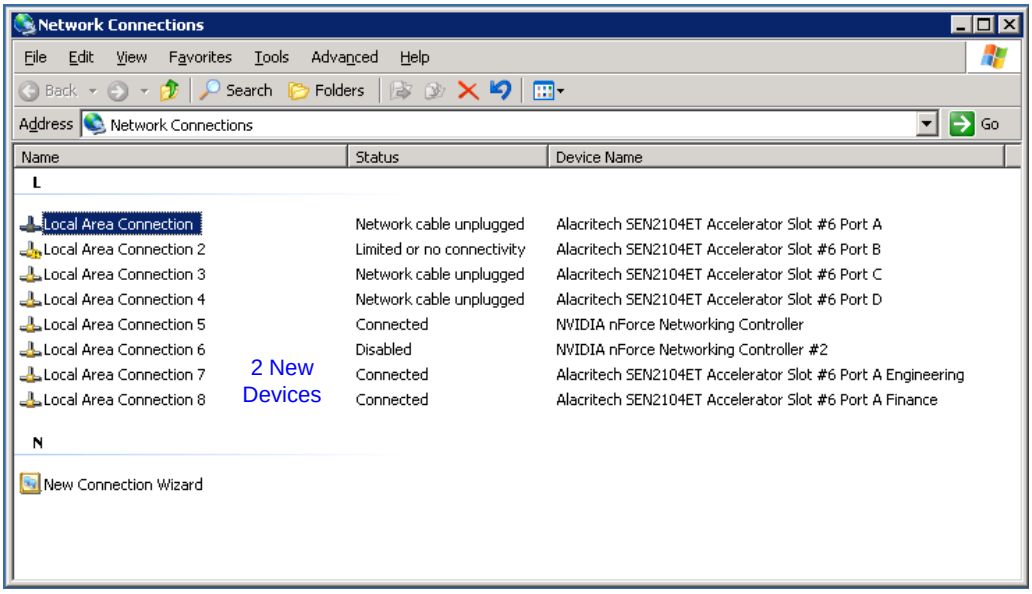
3. Click the **Add VLAN** button and in the Add VLAN dialog enter the VLAN ID (tag) as well as the VLAN Name.


Add VLAN
New VLAN
VLAN ID:
100
VLAN Name:
Engineering
Enter a VLAN Id in the range of 1-4094.
A default name of 'VLAN<n>' where <n> is the Vlan Id will be automatically assigned. You may change the name at this time or modify it later. The name can be up to 32 characters long.
OK
Cancel

4. Click **OK** and then add the second VLAN again using the **Add VLAN** button. After the second VLAN is created the VLAN list will show both VLANs.



5. Now click **OK** to create the two requested VLANs. These appear as unique devices in the Network Connection Property Frame.



6. Configure each of these new devices as a normal network connection. Each requires its own unique IP address on a separate subnet. Notice that Port A of the adapter shows “Network cable unplugged.” This connection is no longer available and is now replaced by the two VLAN network adapters (Local Area Connection 7 and 8).
7. The two VLANs are now configured and should be isolated at the network level. A quick isolation test is to ping an Engineering system from a Finance system. The ping should fail. A ping of a Finance system from another Finance system should succeed.

4 Windows Server Core 2008

Windows Server Core 2008 uses a command line interface rather than the familiar Windows graphical user interface. This chapter describes how to install the Alacritech drivers and configuring the Accelerator for teaming and VLAN using the Slicutil command line utility.

Slicutil.exe is not installed when the driver is installed, but may be found in the distribution package under the \tools folder.

> **Note: Slicutil does not offer all of the management options available through the normal Windows device properties described in Section 3. Check the Alacritech website for availability of an updated version.**

4.1 Installing Alacritech Drivers

For server core 2008, use the **command line install** method described in section 2.4

4.2 Interface Commands

You can verify that the drivers installed successfully with netsh:

```
C:\Temp> netsh int show int

Admin State    State          Type             Interface Name
-------------------------------------------------------------------------
Enabled        Connected      Dedicated        ob1_10net
Enabled        Connected      Dedicated        ob2_csl
Enabled        Connected      Dedicated        Local Area Connection 2
Enabled        Connected      Dedicated        Local Area Connection 3
Enabled        Connected      Dedicated        Local Area Connection 1
```

Or with slicutil:

```
C:\Temp> slicutil interface list
    ID   Type         Connection Name               Member   VLANs
    ============================================================
    7    SEN2102ET    Local Area Connection 2       No       No
    12   SEN2102ET    Local Area Connection 3       No       No
    9    SEN3001EF    Local Area Connection 1       No       No
```

4.3 Configuring Networking

Network configuration is standard netsh stuff. The first thing is to change the interface names to something that makes them easier to identify, and that doesn't contain spaces.

```
C:\Temp> netsh int set int name="Local Area Connection 1"
newname=SEN3001
C:\Temp> netsh int set int name="Local Area Connection 2" newname=SENA
C:\Temp> netsh int set int name="Local Area Connection 3" newname=SENB

C:\Temp> netsh int show int
Admin State    State          Type             Interface Name
-------------------------------------------------------------------------
Enabled        Connected      Dedicated        ob1_10net
Enabled        Connected      Dedicated        ob2_csl
Enabled        Connected      Dedicated        SENA
Enabled        Connected      Dedicated        SENB
Enabled        Connected      Dedicated        SEN3001

C:\Temp> slicutil interface list
   ID    Type         Connection Name               Member   VLANs
   ========================================================================
   7     SEN2102ET    SENA                          No       No
   12    SEN2102ET    SENB                          No       No
   9     SEN3001EF    SEN3001                       No       No
```

Now assign IP addresses. For this example, we assign a IP address 192.168.52.118, netmask 255.255.255.0 to the SEN3001 interface without a default gateway. If you aren't comfortable with slash '/' notation for netmask, refer to netsh documentation for alternatives.

```
C:\Temp> netsh int ip set address SEN3001 static 192.168.52.118/24

C:\Temp> ipconfig
Windows IP Configuration

   ...
Ethernet adapter SEN3001:
Connection-specific DNS Suffix  . :
Link-local IPv6 Address . . . . . : fe80::c8e:8391:2a2a:7343%19
IPv4 Address. . . . . . . . . . . : 192.168.52.118
Subnet Mask . . . . . . . . . . . : 255.255.255.0
Default Gateway . . . . . . . . . :
   ...
```

4.4 Configuring Teaming

It is recommended that the user familiarize themselves with the normal teaming procedures (Section 3.6), and the teaming section of the Server Accelerator FAQ before attempting this procedure.

Now use the slicutil command to create a Hot Standby Failover team from the two ports of the SEN2102ET (Interfaces names: SENA, SENB). To do this, we need to know the interface ID for each interface. This is given in the output of:

```
C:\Temp> slicutil interface list
    ID    Type          Connection Name                Member    VLANs
    ============================================================
    7     SEN2102ET     SENA                           No        No
    12    SEN2102ET     SENB                           No        No
    9     SEN3001EF     SEN3001                        No        No
```

Note that this ID is **not** the same as the `Idx` identifier that is returned by some netsh commands.

Forming the team is pretty straightforward.

```
C:\Temp> slicutil team create memid=7,12 type=hsb
Creating team ... done.

C:\Temp> slicutil interface list
    ID    Type          Connection Name                Member    VLANs
    ============================================================
    7     SEN2102ET     SENA                           Yes       No
    12    SEN2102ET     SENB                           Yes       No
    9     SEN3001EF     SEN3001                        No        No
    20    Team          Local Area Connection 2        No        No
```

Note that there is now a 'Yes' in the 'Member' column for interfaces SENA and SENB, and that there is now a new interface of type 'Team' with ID '20'. Had we wanted to for an 802.3ad link aggregation team, we would have used `type=FEC`, and of course we would have had to configure the switch as well.

We rename the new interface and assign it an IP address of 172.17.2.118 with a netmask of 255.255.255.0

```
C:\Temp> netsh int set int name="Local Area Connection 2"
newname=team_test


C:\Temp> netsh int ip set address team_test static 172.17.2.118/24


C:\Temp> slicutil interface list
    ID    Type          Connection Name                Member    VLANs
    ============================================================
    7     SEN2102ET     SENA                           Yes       No
    12    SEN2102ET     SENB                           Yes       No
    9     SEN3001EF     SEN3001                        No        No
    22    Team          team_test                      No        No
```

```
C:\Temp> netsh int show int

Admin State    State          Type             Interface Name
-------------------------------------------------------------------------
Enabled        Connected      Dedicated        ob1_10net
Enabled        Connected      Dedicated        ob2_csl
Enabled        Connected      Dedicated        SENA
Enabled        Connected      Dedicated        SENB
Enabled        Connected      Dedicated        SEN3001
Enabled        Connected      Dedicated        team_test


C:\Temp> netsh int ipv4 show addresses

Configuration for interface "team_test"
    DHCP enabled:            No
    IP Address:              172.17.2.118
    Subnet Prefix:           172.17.2.0/24 (mask 255.255.255.0)
    InterfaceMetric:         10

Configuration for interface "SEN3001"
    DHCP enabled:            No
    IP Address:              192.168.52.218
    Subnet Prefix:           192.168.52.0/24 (mask 255.255.255.0)
    InterfaceMetric:         5

Configuration for interface "ob2_csl"
    DHCP enabled:            No
    IP Address:              172.16.50.218
    Subnet Prefix:           172.16.48.0/22 (mask 255.255.252.0)
    InterfaceMetric:         10

Configuration for interface "ob1_10net"
    DHCP enabled:            No
    IP Address:              10.1.50.218
    Subnet Prefix:           10.1.0.0/16 (mask 255.255.0.0)
    InterfaceMetric:         20

Configuration for interface "Loopback Pseudo-Interface 1"
    DHCP enabled:            No
    IP Address:              127.0.0.1
    Subnet Prefix:           127.0.0.0/8 (mask 255.0.0.0)
    InterfaceMetric:         50
```

You can now examine the team to determine which interfaces it is created from.

```
C:\Temp> slicutil interface show 22
    Interface ID:    22
    Name:            team_test
    Device Name:     Alacritech Accelerator Team #Team1
    Type:            Hot standby failover Team
    Members:         Alacritech SEN2102ET … Slot #3 Port A Team1 [7]
                     Alacritech SEN2102ET … Slot #3 Port B Team1 [12]
    Properties:      Jumbo Packet:  0 = Disabled
                     IPv4 Checksum Offload:  3 = RX & TX Enabled
                     TCPv4 Checksum Offload:  3 = RX & TX Enabled
                     Receive Side Scaling:  1 = Enabled
                     TCP Large Send Offload:  1 = Enabled
```

4.5 Configuring VLAN Tagging

Tagged VLAN virtual interfaces are created using slicutil as well. It is important to note that once you create a VLAN, the physical interface that the new VLAN is associated with will become unavailable to untagged traffic. The Windows API does not support having a single physical interface pass both tagged and untagged frames. This is unlike switch behaivior where it is quite common for a single port to be a member of both tagged and untagged VLANs. You can create multiple tagged VLAN interfaces on top of a single physical interface,

Starting in the same configuration as the end of the previous section we add a tagged VLAN to SEN3001. The VLAN name is VLAN1, and the VLAN ID is 1. Note that the VLAN name is not the same as the interface name, so after creating the interface we will rename it to vlan_test.

```
C:\Temp> slicutil vlan add parentid=9 vlanid=1 vlanname=VLAN1
Adding test ... done.

C:\Temp> netsh int show int

Admin State    State          Type             Interface Name
-------------------------------------------------------------------------
Enabled        Connected      Dedicated        ob1_10net
Enabled        Connected      Dedicated        ob2_csl
Enabled        Connected      Dedicated        SENA
Enabled        Connected      Dedicated        SENB
Enabled        Connected      Dedicated        SEN3001
Enabled        Connected      Dedicated        team_test
Enabled        Connected      Dedicated        Local Area Connection 2


C:\Temp> slicutil interface list
    ID   Type         Connection Name               Member   VLANs
    ============================================================
    7    SEN2102ET    SENA                          Yes      No
    12   SEN2102ET    SENB                          Yes      No
    9    SEN3001EF    SEN3001                       No       Yes
    19   VLAN         Local Area Connection 2       No       No
    22   Team         team_test                     No       No
```

As you can see interface ID 9 "SEN3001" now shows that it supports a VLAN virtual interface.

Now, to rename the VLAN interface and assign it an IP address of 192.168.60.118/24:

```
C:\Temp> netsh int set int name="Local Area Connection 2" new-
name=vlan_test

C:\Temp> netsh int ip set address vlan_test static 192.168.60.118/24

C:\Temp> netsh int ipv4 show addresses

Configuration for interface "ob1_10net"
    DHCP enabled:           No
    IP Address:             10.1.50.218
    Subnet Prefix:          10.1.0.0/16 (mask 255.255.0.0)
    InterfaceMetric:        20

Configuration for interface "ob2_csl"
    DHCP enabled:           No
    IP Address:             172.16.50.218
    Subnet Prefix:          172.16.48.0/22 (mask 255.255.252.0)
    InterfaceMetric:        10

Configuration for interface "team_test"
    DHCP enabled:           No
    IP Address:             172.16.2.118
    Subnet Prefix:          172.16.2.0/24 (mask 255.255.255.0)
    InterfaceMetric:        10

Configuration for interface "vlan_test"
    DHCP enabled:           No
    IP Address:             192.168.60.118
    Subnet Prefix:          192.168.60.0/24 (mask 255.255.255.0)
    InterfaceMetric:        5

Configuration for interface "Loopback Pseudo-Interface 1"
    DHCP enabled:           No
    IP Address:             127.0.0.1
    Subnet Prefix:          127.0.0.0/8 (mask 255.0.0.0)
    InterfaceMetric:        50
```

4.6 Configuring Advanced Driver Features

The command line interface for configuring advanced interface properties was not complete at the time this page is was written. The idea is to be able to use slicutil to do all of it, but for now, slicutil will only manipulate some, but not all, advanced interface properties for teamed interfaces. Normal interfaces have to be handled with the reg command, as does changing team properties that are not supported by slicutil. VLAN interfaces have no advanced properties, and instead reflect the advanced settings of the underlying physical interface.

4.6.1 Configuring Teamed Interface Advanced Properties Using slicutil.exe

Teamed interface advanced properties are manipulated using the syntax:
`slicutil team modify teamid=<Id> property=value [...property=value...]`
The following properties are supported:

Property	Description	Possible Values	Default Value
Type	Team Type: Either GigabitEtherChannel/802.3ad or Hot Standby Failover	FEC = 802.3ad/GEC hsb = Failover only	FEC = 802.3ad/GEC
Property	All properties except teamtype	Default	None
IPCsumIPv4	IPv4 Checksum Offload	0 = Disabled 1 = TX Enabled 2 = RX Enabled 3 = TX&RX Enabled	3 = TX&RX Enabled
TCPCsumIPv4	TCP Checksum Offload (IPv4)	0 = Disabled 1 = TX Enabled 2 = RX Enabled 3 = TX&RX Enabled	3 = TX&RX Enabled
TCPCsumIPv6	TCP Checksum Offload (IPv6)	0 = Disabled 1 = TX Enabled 2 = RX Enabled 3 = TX&RX Enabled	3 = TX&RX Enabled
Lsov1IPv4	Large Send Offload Version 1 (IPv4)	0 = Disabled 1 = Enabled	1 = Enabled
Lsov2IPv4	Large Send Offload Version 2 (IPv4)	0 = Disabled 1 = Enabled	1 = Enabled

Lsov2IPv6	Large Send Offload Version 2 (IPv6)	0 = Disabled 1 = Enabled	1 = Enabled
RSS	Receive Side Scaling	0 = Disabled 1 = Enabled	1 = Enabled
JumboPacket	Jumbo Packet	0 = Disabled (1500 MTU) 1 = Enabled (9000 MTU)	0 = Disabled

In one of the examples above, we created a Hot Standby team. Starting with that team, we can use slicutil to change the team type to FEC and enable jumbo frames.

```
C:\Temp> slicutil team modify teamid=22 type=FEC jumbopacket=1
Modifying Alacritech Accelerator Team #Team1 ... done.

C:\Temp> slicutil interface show 22
    Interface ID:     22
    Name:             team_test
    Device Name:      Alacritech Accelerator Team #Team1
    Type:             802.3AD Team
    Members:          Alacritech SEN2102ET Accelerator Slot #3 Port A
Team1 [7]
                      Alacritech SEN2102ET Accelerator Slot #3 Port B
Team1 [12]
                      Jumbo Packet:  1 = Enabled
                      IPv4 Checksum Offload:  3 = RX & TX Enabled
                      TCPv4 Checksum Offload:  3 = RX & TX Enabled
                      Receive Side Scaling:  1 = Enabled
                      TCP Large Send Offload:  1 = Enabled
```

4.6.2 Configuring Normal Interface Advanced Properties Using reg.exe

Warning: The following procedure requires careful attention to detail. Typographic errors can result in unpredictable behavior.

Configuring driver properties using the reg command is a workaound until a safer simpler method is available though an updated version of slicutil. The basic idea is that you use reg.exe to modify registry values, and then reset the interface (via netsh) to get it to read the new values. For a description of what the registry setting do, see the driver options page

Because it is easy to make mistakes when messing with the registry in this fashion, we recommend that the first thing you do is set a variable to contain the base registry path.

```
set REGNET=HKLM\SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-
11CE-BFC1-08002BE10318}
```

The ID value returned by **`slicutil interface list`** is the same as the registry key under HKLM\SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-11CE-BFC1-08002BE10318} when zero padded to four digits.

So to disable TCP offload (IPv4) on the interface ID 9 (SEN3001), you would first query it's current state:

```
C:\Temp> reg query %regnet%\0009 /v *TCPConnectionOffloadIPv4

HKEY_LOCAL_MACHINE\...\0009
    *TCPConnectionOffloadIPv4    REG_SZ    1

End of search: 1 match(es) found.
```

Verify that the change was made as expected.

```
C:\Temp> reg query %regnet%\0009 /v *TCPConnectionOffloadIPv4

HKEY_LOCAL_MACHINE\...\0009
    *TCPConnectionOffloadIPv4    REG_SZ    0

End of search: 1 match(es) found.
```

Finally, use netsh to reset the interface. This will force the interface to read the updated registry value.

```
C:\Temp> netsh int set int SEN3001 disable

C:\Temp> netsh int set int SEN3001 enable
```

5 Troubleshooting and Support

5.1 Alacritech Automated Customer Support

You can reach Alacritech's automated support service 24 hours a day, every day. The service contains the most up-to-date information about Alacritech products. You can access the most current drivers, installation instructions, troubleshooting information, and general product information.

Support: http://www.alacritech.com/Support/Overview.aspx

Corporate: http://www.alacritech.com/

5.2 README Files on CD-ROM

For more information about known issues, open bugs or other integration problems with Microsoft Windows drivers, see the readme.html documentation and RelNotes.txt release notes. To view the files, go to the **Alacritech Driver Installation CD** and open it with any web browser or text editor.

5.3 Troubleshooting Overview

This chapter describes specific problems with installation or use that may arise and their solutions. It covers the following issues:

- Installation Problems
- Event Log Errors
- Connectivity Problems
- Performance Problems
- Miscellaneous Issues About Dynamic TCP Offload

5.4 Installation Problems

This section covers errors and problems surrounding installation only. For other problems, please see the other sections in this chapter.

Problem	Solution
TCP Offload does not work	TCP Chimney offload will not work with the following features: • Windows Firewall (Windows XP enabled by Default) • Internet Protocol security (IPsec) • Internet Protocol Network Address Translation (IPNAT) • Third-party firewalls • NDIS 5.1 intermediate drivers If any one of these features is turned on, TCP Chimney offload will not work regardless of the registry settings. See Chapter 3 for instructions on disabling these features.

5.4.1 Disabling Windows Firewall to Enable TCP Offload

In Windows XP Professional and Windows Server 2003, it is necessary to disable Windows Firewall/Internet Connection Sharing to activate the TCP Offload feature on the Accelerators in your system.

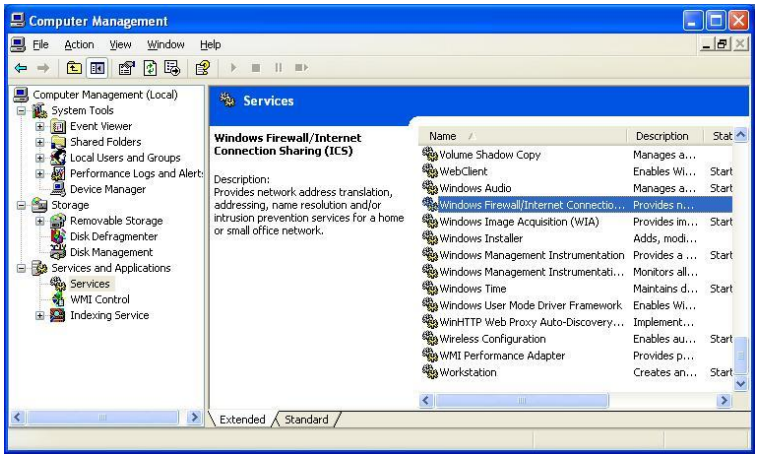
Note: The Windows Firewall Service must be explicitly turned off before TCP Chimney can function under Windows XP and Windows Server 2003.

Note: By default, the IP NAT and IPsec Policy Agent features are turned on when certain components such as bridging and routing services are enabled. Therefore, TCP Chimney will not function in such a scenario. When the bridging and routing services are disabled, IPNAT is not turned off. Therefore, TCP Chimney is not re-enabled.

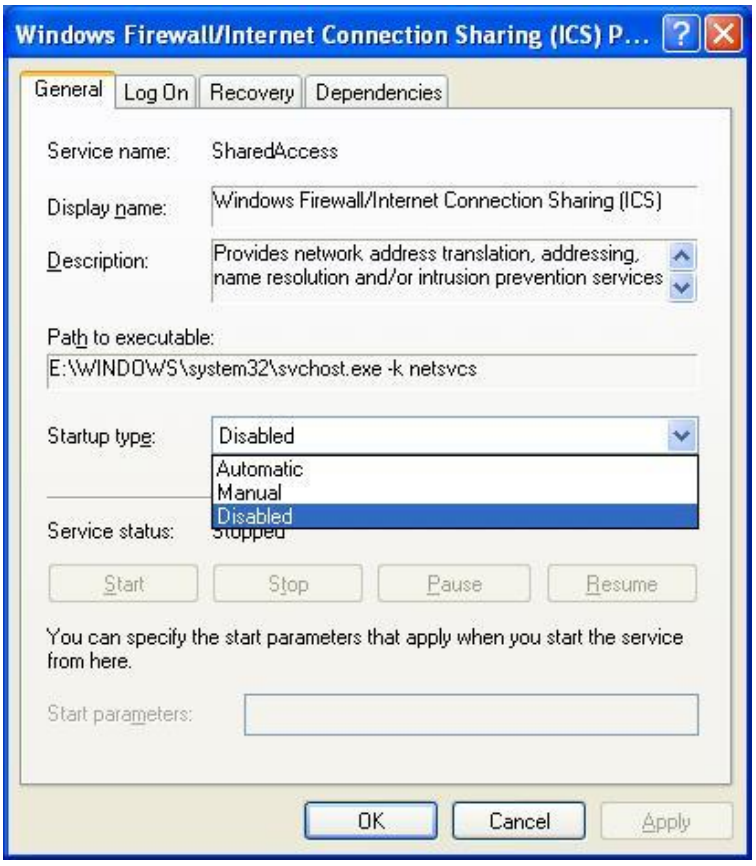
The IP NAT and IPsec Policy Agent features must be explicitly turned off before TCP Chimney can function.

To disable this feature, use the following procedure:

1. Start Computer Management - from the **Start** menu, right click **My Computer** and select **Manage**.
2. Under **Services and Applications**, click on **Services**. On the right side, scroll down and double click on **Windows Firewall/Internet Connection Sharing (ICS)**, select **Disabled**.



3. Under **Startup Type**, select **Disabled**.



4. Click **OK**.

5.5 Event Log Errors

This section covers entries written to the Event Log. You can view the Event Log from the Event Viewer located in the Administrative Tools folder on the Start Menu, located under Programs.

Problem	Solution
Event Log reports *"SLIC<x> Has determined that the adapter is not functioning properly"*	• Run Diagnostics from NCPA. See the procedure in Chapter 3. • Contact Alacritech technical support for assistance. This is probably the result of a malfunctioning adapter.

5.6 Connectivity Problems

This section covers problems with network connectivity.

Problem	Solution
There is no connectivity at all with other computers on the network. Pinging does not work.	• Make sure that the cables are attached securely at both RJ-45 connections (adapter and switch) and that the network cable is otherwise functional. • Make sure that the network cables are plugged into the correct port of the adapter. The driver will list the slot and port for the interface. • Check the LED indicators on the adapter. Each port has LEDs for link/link speed and activity. These lights help indicate if there is a problem with the adapter, switch or cable. Refer to the "LED Function Indicators" chart below.

5.6.1 Alacritech SEN2002XT, SEN2001XT, SES2002XT and SES2001XT Accelerator LED Function Indicators

LED	Indication	Meaning
ACT/LNK	Green On	The port is connected to a valid link partner.
	Green Flashing	The Accelerator is sending or receiving network data.
	Off	The Accelerator is not connected to a valid link partner.
10/100/1000	Off	A 10 Mbps link has been established (if the ACT/LNK LED is on or flashing).
	Green	A 100 Mbps link has been established.
	Yellow	A 1000 Mbps link has been established.

5.6.2 Alacritech SEN2002XF, SEN2001XF, SES2002XF and SES2001XF Accelerator LED Function Indicators

LED	Indication	Meaning
LNK	Green On	The Accelerator and the switch are receiving power; the fiber optic cable connection between them is good, and a 1000 Mbps link has been established.
	Off	Either the Accelerator or the switch (or both) is not receiving a proper signal. The fiber optic cable connection between them may be faulty.
ACT	Yellow Flashing	The Accelerator is sending or receiving network data.
	Off	The Accelerator is not sending or receiving network data.

5.6.3 Alacritech SEN3001EF Accelerator LED Function Indicators

LED	Indication	Meaning
LNK	Green On	The Accelerator and the switch are receiving power; the fiber optic cable connection between them is good, and a 10Gbps link has been established.
	Green Flashing	The Accelerator is sending and/or receiving network data.
	Solid Off	Either the Accelerator or the switch (or both) is not receiving a proper signal. The fiber optic cable connection between them may be faulty or the SFP+ module may not be seated properly.

Appendix A Network Software License Agreement and Warranty

PLEASE REVIEW THE LICENSE AGREEMENT BELOW. BY OPENING THIS SOFTWARE OR PACKAGE OR OTHERWISE DOWNLOADING OR COPYING THIS SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS AGREEMENT. DO NOT USE THIS SOFTWARE UNTIL YOU HAVE CAREFULLY READ AND AGREED TO THE FOLLOWING TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, DO NOT INSTALL OR USE THIS SOFTWARE.

LICENSE: Alacritech, Inc. ("Alacritech") grants you the non-exclusive right to use the enclosed software program (the "Software") but only in conjunction with, at a minimum, one Alacritech Accelerator. You may not use, copy, modify, rent, sell or transfer the Software or any portion thereof except as provided in this Agreement.

You may:

1. Install and use the Software on one or more personal computers and/or local area network ("LAN") servers;

2. Copy the Software only for the purposes of installing and using the Software on personal computers and/or LAN servers as described above, and for backup or archival purposes.

RESTRICTIONS:

You will not:

1. Sublicense the Software,

2. Reverse-engineer, de-compile, or disassemble the Software,

3. Copy the Software, in whole or in part, except as provided in this Agreement.

TRANSFER: You may transfer the Software to another party if the receiving party agrees to the terms of this Agreement and you retain no copies of the Software and accompanying documentation. Transfer of the Software terminates your right to use the Software.

OWNERSHIP AND COPYRIGHT OF SOFTWARE: Title to the Software and all copies thereof remain with Alacritech or its suppliers. The Software is copyrighted and is protected by the United States and other countries, and international treaty provisions. You will not remove the copyright notice from the Software. You agree to prevent any unauthorized copying of the Software. Alacritech may make changes to the Software, or to items referenced therein, at any time without notice, but is not obligated to support, upgrade, or update the Software. Except as otherwise provided, Alacritech grants no express or implied right under Alacritech patents, copyrights, trademarks, or other intellectual property rights.

FREEBSD SOFTWARE: Some portions of the Software are:

Copyright © 1994-2003 FreeBSD, Inc. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE FREEBSD PROJECT "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The views and conclusions contained in the software and documentation are those of the authors and should not be interpreted as representing official policies, either expressed or implied, of the FreeBSD Project or FreeBSD, Inc.

LIMITED MEDIA WARRANTY: Alacritech warrants that the media on which the Software is furnished will be free from defects in material and workmanship for a period of one (1) year from the date of purchase. Upon return of such defective media, Alacritech's entire liability and your exclusive remedy shall be the replacement of the Software.

Exclusions of other warranties: THE SOFTWARE IS PROVIDED "AS IS" WITHOUT WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF NON-INFRINGEMENT OF INTELLECTUAL PROPERTY, MERCHANTABILITY, OR FITNESS FOR ANY PARTICULAR PURPOSE. Alacritech does not warrant or assume responsibility for the accuracy or completeness of any information, text, graphics, links, or other items contained within the Software.

LIMITATION OF LIABILITY: IN NO EVENT SHALL ALACRITECH HAVE ANY LIABILITY FOR ANY INDIRECT OR SPECULATIVE DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITING THE FOREGOING, CONSEQUENTIAL, INCIDENTAL, AND SPECIAL DAMAGES) INCLUDING, BUT NOT LIMITED TO, INFRINGEMENT OF INTELLECTUAL PROPERTY, REPROCUREMENT COSTS, LOSS OF USE, BUSINESS INTERRUPTIONS, AND LOSS OF PROFITS, IRRESPECTIVE OF WHETHER ALACRITECH HAS ADVANCE NOTICE OF THE POSSIBILITY OF ANY SUCH DAMAGES. SOME JURISDICTIONS PROHIBIT EXCLUSION OR LIMITATION OF LIABILITY FOR IMPLIED WARRANTIES OR CONSEQUENTIAL OR INCIDENTAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. YOU MAY ALSO HAVE OTHER LEGAL RIGHTS THAT VARY FROM JURISDICTION TO JURISDICTION.

AUDIT: Alacritech reserves the right to have audits conducted to verify your compliance with this Agreement.

TERMINATION OF THIS LICENSE: Alacritech may terminate this license at any time if you are in breach of any of its terms and conditions. Upon termination, you will immediately destroy the Software and documentation or return all copies of the Software and documentation to Alacritech.

U.S. GOVERNMENT RESTRICTED RIGHTS: The Software and documentation were developed at private expense and are provided with "RESTRICTED RIGHTS." Use, duplication, or disclosure by the Government is subject to restrictions as set forth in FAR 52.227-14 and DFAR 252.227-7013 et seq. or its successor. Use of the software by the Government constitutes acknowledgment of Alacritech's proprietary rights therein. Contractor or Manufacturer is Alacritech, Inc., 1995 North First Street, Suite 200, San Jose, CA 95112, USA.

EXPORT LAWS: You agree that the distribution and export/re-export of the Software is in compliance with the laws, regulations, orders or other restrictions of the U.S. Export Administration Regulations. Some products may contain encryption technology. U.S. Department of Commerce Encryption Regulations are applicable on all products imported to and exported from the United States and Puerto Rico. Additionally, imports and exports may be regulated by government agencies in other countries. Intra-country restrictions may be applicable regarding application use. You agree that the distribution and import, export, and re-export of the Software is in compliance with all applicable laws, regulations, orders or other restrictions on encryption technology.

GOVERNING LAW: Claims arising under this Agreement shall be governed by the laws of California, excluding its principles of conflict of laws and the United Nations Convention on Contracts for the Sale of Goods. Alacritech is not obligated under any other agreements unless they are in writing and signed by an authorized representative of Alacritech.

SEVERABILITY: The terms and conditions stated in this Agreement are declared to be severable. If any paragraph, provisions, or clause in this Agreement shall be found or be held to be invalid or unenforceable in any jurisdiction in which this Agreement is being performed, the remainder of this Agreement shall be valid and enforceable and the parties shall use good faith to negotiate a substitute, valid, and enforceable provision which most nearly effects the parties' intent in entering into this Agreement.